

Mojave National Preserve

National Park Service
U.S. Department of the Interior



Environmental Assessment

Reconstruct Road Segments to Improve Safety (PMIS 18464)

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CHAPTER 1: PURPOSE AND NEED

INTRODUCTION

The National Park Service (NPS) proposes to make safety improvements on paved and unpaved roads within Mojave National Preserve (Preserve), in San Bernardino County, California (Figure 1). The proposed changes to eight roadway locations are designed to reduce the number of accidents within the Preserve by improving roadway elevations, grades, curvature, and sight distances, and by realigning two intersections. Five locations, including the intersections, are on paved roads, and total approximately 1.9 linear miles. The project also includes improvements to maintain safe ingress/egress at three sites on unpaved roads that serve as main access roads for the local community. Roadway embankment protection totaling about 1.6 miles in length will be installed where flood events have frequently caused damage, and two low water crossings which total 320 feet in length will be reinforced to reduce the severity and incidence of washouts.

This Environmental Assessment (EA) analyzes a Proposed Action and the No Action Alternative and their impacts on the human and natural environment. It describes the two project alternatives, the existing conditions in the project area, and equally analyzes the effects of each project alternative on the environment. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations, Council of Environmental Quality (CEQ) regulations, Code of Federal Regulations (CFR), Title 40 Parts 1500-1508; and NPS Director's Order #12 (DO-12) and Handbook, Conservation Planning, Environmental Impact Analysis, and Decision-making. Separate documentation has been prepared to comply with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and implementing regulations, 36 CFR Part 800.



Figure 1: Location of Mojave National Preserve

PURPOSE AND NEED

Purpose

The purpose of the proposed project is to improve public safety by reducing the number and severity of traffic accidents in the Preserve. It would also enhance the visitor experience by correcting existing road design deficiencies and conditions that endanger those driving through the Preserve or limit safe access to residences and facilities. Numerous serious accidents occur every year on Preserve roads, often involving vehicle rollovers, injuries and fatalities.

Need for the Project

Mojave National Preserve roads have seen a significant increase in traffic from motorists visiting the Preserve. In 1993, the year before the Preserve was designated, visitation was estimated at 250,000. In 2011, the Preserve had 536,000 visitors (Road System Evaluation, Mojave National Preserve, 2013). Some sections of road most frequently used by Preserve visitors have geometric deficiencies that contribute to vehicular accidents and fatalities. From 2001 to 2012, there were 134 accidents on Kelbaker Road, four of which were fatalities (accident data from the San Bernardino County Department of Public Works, and CH2M Hill). During the same timeframe, there were 50 accidents on Morning Star Mine Road, with three fatalities. There were 62 accidents on Kelso/Cima Road, and eight on Black Canyon Road during the same 11-year period.

The problems on these sections of paved and dirt roads include: tight horizontal and vertical curve alignments (sharp curves and/or dips); improper super-elevation (banking or tilting of the roadway surface), inadequate sight distance; inadequate signage; and poorly configured intersections. These dangerous road conditions have contributed to high accident rates and increased accident severity (such as rollover crashes, as shown in Figure 2), particularly for drivers who are distracted by the scenery, and/or exceeding the speed limit. Safe access for residents, visitors, and emergency personnel is also compromised when storms wash out sections of unpaved road.



Figure 2: Rollover Crashes in the Preserve

Based on currently available information and conditions, the following road sections have been identified as requiring attention. Three sections of Kelbaker Road are in need of safety improvements. Kelbaker Road is generally a long straight stretch of road. However, three sections of the road are interrupted by sharp curves and abrupt grade changes that limit sight lines and make it difficult to see oncoming traffic and wildlife on the roadway. Vehicles cannot

safely negotiate the curves, hills, and dips and frequently drive off the road, resulting in numerous single-vehicle accidents. This occurs at a section of road approximately 10 miles southeast from Baker (Site 1), at Kelso Pass (Site 2), and Granite Pass (Site 3). At the T intersection of Kelbaker Road and Kelso-Cima Road (Site 4), the Union Pacific Railroad crosses Kelbaker Road approximately 100 feet south of the intersection, and is higher than the road grade, limiting sight distance for vehicles. Vehicles on Kelso-Cima Road have difficulty seeing traffic approaching from either direction on Kelbaker Road, and the area is also dangerous to pedestrians. Kelso-Cima Road, Cima Road, and Morning Star Mine Road form a Y intersection in Cima that is confusing to visitors (Site 5). Due to the confusing nature of the intersection, vehicles frequently stop on Kelso-Cima Road immediately north of the northern railroad spur to decide which way to proceed. There is no stop sign control on that leg of the intersection. When stopped, vehicles are often rear-ended due to the limited lines of sight.

Two sections of the unpaved Cedar Canyon Road (Site 6) are frequently damaged during storm events, limiting safe access for visitors, residents, and emergency personnel to the east side of the Preserve. Black Canyon Road, also unpaved, has a curve with incorrect super-elevation (banking) that causes vehicles to careen off the road (Site 7). Another section of Black Canyon Road also washes out during storm events, cutting off access to/from private residences and the Mid Hills and Hole-in-the-Wall trails and campgrounds (Site 8). Figure 3 shows examples of storm damage. Chapter 2 of this document provides a location map and description for the sites.



Figure 3: Storm Damage on Black Canyon Road

Project Objectives

The project should meet the following objectives:

- Reduce motor vehicle crashes in the Preserve;
- Improve road safety while protecting wilderness areas and the federally threatened desert tortoise;
- Reduce maintenance costs associated with roads that receive frequent localized flooding; and decrease the time required to restore access;
- Improve the visitor experience for both motorists and pedestrians by reducing dangerous road conditions and confusion at intersections.

BACKGROUND

Mojave National Preserve is a 1.6 million-acre unit of the National Park Service, established by Congress on October 31, 1994, by the California Desert Protection Act (CDPA). The Preserve is a vast expanse of desert lands that represents a combination of Great Basin, Sonoran, and Mojave Desert ecosystems. This combination allows a visitor to experience a wide variety of desert plant life in combinations that exist nowhere else in the United States in such proximity.

Purpose and Significance of the Preserve

Mojave National Preserve protects a diverse mosaic of desert ecological communities and functions, and evidence of a 10,000-year history of human connection with the desert. By offering extensive opportunities to experience a wide variety of landscapes, the preserve promotes understanding and appreciation for the increasingly threatened resources of the Mojave Desert, and encourages a sense of discovery and connection to wild places.

Located in southern California, the Preserve contains several diverse mountain ranges, the Kelso dune system, dry lake beds and abundant evidence of geologically recent volcanic activity (domes, lava flows, and cinder cones). Plant and animal life complement the geological features - the Preserve contains some of the finest Joshua tree forests in the world. Providence Mountain State Recreation Area (Mitchell Caverns), the University of California's Granite Mountains Natural Reserve and California State University's Soda Springs Desert Studies Center at Soda Springs are also within the boundaries.

The Preserve is bounded to the north and south by major interstate highways, I-15 and I-40. The Nevada-California state-line makes up most of the eastern boundary. Located about half way between Las Vegas and Joshua Tree National Park, it is an area that many people have seen through their windshields but rarely have a chance to explore.

Of the Preserve's 1.6 million acres, about 700,000 acres are designated wilderness. In addition, about half is designated as critical habitat for the federally listed threatened desert tortoise.

Evidence of the early human uses includes archeological sites, possibly dating back to 12,000 years. Historic features, such as mail and trade/travel routes, ranching, farming, and mining, are abundant and often well preserved. The recently restored Union Pacific train depot at Kelso is an excellent example and reminder of the historical significance of the railroad to the development of the American West in the early part of the twentieth century. The collection of buildings at Soda Springs, called Zzyzx, as well as other historical features such as the Fort Piute, Government Holes, and Ivanpah town sites, add to the rich history of the Preserve.

Project Area Description

The roads within the project area are well traveled for a remote desert environment. The Preserve roads form a major north-south thoroughfare that connects the cities of Southern California to Las Vegas, NV. The northern boundary of the Preserve parallels Interstate 15, which serves as a major transportation corridor through the state between Los Angeles and Las Vegas, and many states to the east. I-15 carries the highest daily traffic volumes of any highway in the area (5,200 vehicles peak hour, 2012). I-15 traffic increases on weekends as residents of Los Angeles travel to Las Vegas and then return. Traffic accidents, snow in the area of Mountain Pass, which reaches an elevation of over 4700 feet, and other incidents can close sections of I-15, forcing traffic to be routed through the Preserve and back onto I-15.

There are approximately 2,180 miles of roads within the Preserve (NPS, 2000). Approximately 255 miles of paved and unpaved roads are used and maintained in the Preserve; another 345 miles of roads are closed to mechanized and motorized use by Congressional designation of wilderness in the 1994 California Desert Protection Act. The remaining roads were originally constructed for a variety of historical uses (e.g., mining, ranching, etc.), and are not maintained by the Preserve. However, they are available for recreational use and are very popular with four-wheel drivers and organizations. This project proposes to address high-accident locations at several curves and intersections within the Preserve: on sections of Kelbaker Road, Cedar Canyon Road, Black Canyon Road and intersections at Kelbaker/Kelso-Cima Roads and Morning Star Mine/Cima/Kelso Cima.

Mojave National Preserve has six main paved entryways: Kelbaker Road, Cima Road, and Ivanpah Road off of I-15 on the north side; Kelbaker Road and Essex Road off I-40, and Goffs/Lanfair Road off of Route 66 on the south side. All these roads generally lead visitors in a north-south orientation with Kelso as a common point for four of the roads. The roads are all suitable for standard sedans. Among these roads, Kelbaker road from I-40 to Kelso, Kelso-Cima Road and Morning Star Mine Road receive the heaviest use. The Kelso and Cima town sites are located at major intersections. In 2012, the FHWA conducted a Road Inventory Program (RIP), inventory and condition assessments on all paved roads within the Preserve. Data collected through the assessment showed that 68.56 miles (39%) are in Poor condition; 46.55 miles (26%) are in Fair condition; 44 miles (25%) are in Good condition; and 16.14 miles (9%) are in excellent condition. Most traffic occurs on weekends as many drivers use these roads to travel to and from Las Vegas, Twenty-nine Palms, and Palm Springs.

In addition to the design deficiencies described previously, the pavement at these locations is generally thin (1 to 2 inches) and has exceeded its service life. Although the roadway width is adequate in most locations, it is inconsistent due to shoulder drop-offs, dips, and spalled asphalt pavement. Thousands of potholes exist; alligator, transverse and longitudinal surface cracks have developed, and shoulders are deteriorated. All of these conditions increase the potential for vehicular accidents. Furthermore, the Preserve's Visitor and Resource Protection Rangers routinely issue citations for speeding violations ranging from 65 to over 100 mph. On most horizontal curves, there is little or no curve widening or banking, and the super elevation is not sufficient for the design speed of the roadway. As shown on Figure 4, several sites on Kelbaker Road have a combination of abrupt curves and elevation changes that contribute to unsafe conditions. The specific locations with the highest accident rates are primarily due to excessive driver speed on long tangents leading to sharp curves, in combination with abrupt horizontal and vertical alignment changes, roadway dips and rises due to low-water crossings, and poor intersection alignment with limited sight distance. Both the intersections of Cima Road, Kelso-Cima Road, and Morning Star Mine Road, and the intersection at Kelso Depot with Kelbaker Road are located near a railroad grade crossing which blocks motorist's view of the approaching stop signs. The combination of poor sight distance and poor intersection alignment and geometry has contributed to numerous accidents.

The responsibility for maintenance of 255 miles of roads, including 180 miles of paved roads, was transferred from San Bernardino County to the Preserve in 2013 as a result of a 2012 settlement with the Department of Interior, in which San Bernardino County agreed to relinquish its claims to the roads in Mojave National Preserve. The agreement was approved by San Bernardino County in September 2013: 14 roads, associated roadway improvements, and their

rights-of-way where the roads cross private lands were transferred to the Department of the Interior on September 10, 2013.



Figure 4: Sharp turns on Kelbaker Road east of Baker and at Granite Pass

LAWS, PLANS AND POLICIES

Many regulations and Executive Orders are addressed in NEPA documents. The following is a summary of relevant guidance documents and regulations and a description of their relationship to the proposed project. Other applicable regulations, plans, and standards that were considered in the development of this EA and the analysis of the impacts are described in Chapter 3.

Plans

Foundation Document, Mojave National Preserve, CA, and June 2013: The Foundation Document for the Preserve is a formal statement of its core mission to provide basic guidance for all planning and management decisions, and updates the General Management Plan. It helps stakeholders understand the Preserve's purpose, significance, interpretive themes, fundamental resources and values, and special mandates and administrative commitments, as well as legal and policy requirements for administration and resource protection.

The foundation document for Mojave National Preserve is used to integrate and coordinate planning and decision making from a single, shared understanding of what is most important about the Preserve, so that Preserve managers can ensure that the most important objectives are accomplished before addressing other items that are also important but may not be critical to achieving the Preserve purpose and maintaining its significance. Thus, the foundation document is essential for effectively managing the Preserve over the long term and protecting the resources and values that are integral to its purpose and identity.

Mojave National Preserve has a long, robust history as a well-travelled corridor across a harsh and foreboding desert, linking the Southwest with the coast of California from ancient times to the present. This project continues in this tradition of providing safe visitor access to a large relatively intact desert ecosystem exemplifying the rugged beauty of the western desert. The roadways provide access to diverse scenic landscapes and visual qualities that foster a sense of discovery and contribute to an emotional connection for visitors.

The Foundation Document discusses the need for a Roads Management Plan that would identify road standards to be applied that are consistent with other Preserve resources and values. This

plan has been identified as a high priority need, and is currently in development. It would address strategies for maintenance and repair as well as guidance for visitor circulation.

Mojave National Preserve General Management Plan (GMP), July 2002: A park's general management plan provides a vision and policy guidance for the preservation of park resources, visitor use and experience, the types and general intensities of development, visitor carrying capacities, and opportunities to address management issues internal and external to the park. It also identifies connections among various park programs and provides a policy framework for more site-specific planning. The NPS planning process involves several levels of planning that become increasingly more detailed and complementary. General management plans represent the first phase of a tiered planning system for parks and provide the overall management framework under which other more detailed activity plans are developed. General management plans are broad in scope rather than specific, and focus on purposes of the unit, its significant attributes, its mission in relation to the overall mission of the agency, activities that are appropriate within these constraints, and what resource conditions and visitor experiences should exist there. They also provide guidelines for visitor use and development of facilities for visitor enjoyment and administration. Decisions about site-specific actions are deferred to implementation planning when more detailed site-specific analysis would be done.

When the GMP (2002) was written, the National Park Service did not own or maintain the majority of paved roads. That responsibility was transferred to the Preserve in 2013, as a result of a 2012 settlement between San Bernardino County and the U.S. Dept. of Interior.

Mojave National Preserve Business Plan 2007: The business plan describes the financial and operational condition of Mojave National Preserve in Fiscal Year (FY) 2007 and provides insight into the Preserve's direction over the next five years. It is the result of an objective, in-depth look at Mojave's historical trends, current operations, projected financial outlook, and management priorities. The plan is intended to communicate both the challenges and opportunities that will face Mojave National Preserve in the next five years. In 2007, Mojave's Operations and Maintenance program was responsible for all aspects of 28 miles of park roads, including grading/gravel surfacing, stabilizing, cleaning the roadsides and repairing damaged culverts.

National Park Service, Park Road Standards (1984): This document identifies NPS road design standards that accommodate planned park road use, while continuing to preserve the natural and cultural values of the NPS system. It states that the purpose of the national parks and the quality of the park experience must be the primary concern when designing roads; the visitor experience should be safe and leisurely. Roads are to be designed with extreme care and sensitivity with respect to the terrain and environment, and be laid lightly on the land. Park roads are not intended to provide fast and convenient transportation; they are intended to enhance the visitor experience while providing safe and efficient accommodation of park visitors and to serve access needs. These standards and classification of park roads remain a primary reference for current day road design.

Roads Management Plan, under development: Preserve personnel are currently finishing a detailed draft of a *Roads Management Plan* which will be available to the general public for comment in December 2014. This plan will clarify the Preserve's standards and goals for roadway maintenance and operations, worker safety, emergency road response, and wildlife protection, among other chapters.

Laws and Policies

National Park Service Organic Act. The NPS Organic Act directs the NPS to manage units “to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner as will leave them unimpaired for the enjoyment of future generations.” (16 USC §1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that the NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress.” (16 USC § 1 a-1). The Organic Act prohibits actions that permanently impair park resources unless directly and specifically allowed by law. An action constitutes impairment when its impacts “harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources and values.” (Management Policies 1.4.3).

National Parks and Recreation Act of 1978. Public Law 95-625, the National Parks and Recreation Act of 1978, requires the preparation and timely revision of general management plans for each unit of the National Park System. The NPS Management Policies (U.S. Department of the Interior, 2001) calls for each GMP to “... set forth a management concept for the park [and] establish a role for the unit within the context of regional trends and plans for conservation, recreation, transportation, economic development, and other regional issues” Congress also directed (16 USC 1a-7[b][4]) the NPS to consider, as part of the planning process, what modifications of external boundaries might be necessary to carry out park purposes.

General Authorities Act of 1970. This act defines the National Park System as including “... any area of land and water now or hereafter administered by the Secretary of the Interior through the NPS for park, monument, historic, parkway, recreational, or other purposes ... ” (16 USC 1c[a]). It states that “... each area within the national park system shall be administered in accordance with the provisions of any statute made specifically applicable to that area ... ” (16 USC 1c[b]) and in addition with the various authorities relating generally to NPS areas, as long as the general legislation does not conflict with specific provisions.

National Historic Preservation Act of 1966. The National Historic Preservation Act (NHPA) of 1966 (as amended) requires that proposals and alternatives relating to actions that could affect cultural resources both directly and indirectly, and the potential effects of those actions, be provided for review and comment by the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officer (THPO), and sometimes, the Advisory Council on Historic Preservation (ACHP). Therefore, the document will be submitted to the appropriate offices for review and comment according to the procedures in 36 CFR Part 800 and delineated in the 1995 Programmatic Agreement signed by the NPS, the National Conference of State Historic Officers, and the Advisory Council on Historic Preservation.

Management Policies 2006. *NPS Management Policies* (2006) include direction for preserving and protecting cultural resources, natural resources, processes, systems, and values (NPS 2006). Although management policies are not applicable to non-NPS lands, it is the goal of the NPS to avoid or minimize potential impacts to resources to the greatest extent practicable consistent with the management policies.

PLANNING PROCESS AND PUBLIC SCOPING

A list of issues and concerns related to improvements to the project were identified through park internal scoping and through the public scoping process. Internal scoping involved an interdisciplinary team of NPS and Federal Highway Administration (FHWA) staff who determined potential issues and impact topics.

The Public Scoping period occurred between January 15 and February 15, 2014. Press releases and announcements in seven newspapers provided information on how the public could comment on the project. Information about the project was posted on the National Park website announcing the project and asking for the public's input: <http://parkplanning.nps.gov/moja-road-safety>. A project newsletter detailing road locations and activities was sent to over 140 interested parties. Newsletters were made available at the visitor centers. Twenty scoping letters were sent to Federal, state and tribal agencies. A Public Scoping meeting was held on February 1, 2014, from 10:00 a.m. to 12:00 p.m., at the Interagency Fire Center at Hole in the Wall, 1 Black Canyon Road, Essex, CA, 92332.

Eighteen written comments were received from the public via mail and email during the Public Scoping period. Eighteen comments were submitted during the Public Scoping meeting that was attended by five members of the public. All comments were reviewed and considered during development of the Proposed Action. A summary of the comments are included in Chapter 5.

SCOPE OF THE ENVIRONMENTAL ASSESSMENT

In April 2013, at the request of the NPS, the Federal Highway Administration, Central Federal Lands performed a safety assessment on several of the routes within Mojave National Preserve. The goal of the safety assessment was to provide insights into implementing low-cost safety measures in areas of frequent vehicular accidents and fatalities. FHWA recommended that the safety management program for the Preserve systematically address overall safety issues and include 1) engineering, 2) enforcement, 3) education, and 4) emergency response. Enforcement of speed and adherence to traffic laws and education are not included in the scope of this EA since they are administrative in nature and not subject to NEPA due to their lack of impact on the environment. This EA focuses on the engineering solutions proposed by FHWA to improve safety on the most frequently used high accident sections of roadway.

There are many sites where roads cross floodplains in the Preserve and frequently wash out with storm events; however, the scope of the project was also limited to the repairs on the most critical, well-traveled roads that serve as primary access routes through the Preserve.

Issues and Impact Topics Identified for Further Analysis

Issues were identified by an NPS interdisciplinary planning team, the public and other agencies during the public scoping process. Issues are problems, concerns, and opportunities regarding the Proposed Action. These issues formed the basis for the impact topics that are carried forward and discussed in Chapters 3 and 4 of this EA. Impact topics identify the resources or values that would be affected by the alternatives. The issue statements and corresponding impact topics developed by the interdisciplinary team are presented below.

Cultural Resources. A primary responsibility of the National Park Service is to identify, protect, and provide for public enjoyment and appreciation of the cultural resources under its jurisdiction. Cultural Resources include: archaeological resources, cultural landscapes, structures, museum objects, and ethnographic resources. One site (Site 2; Kelbaker Road at Kelso Pass) in the

proposed project is close to an identified Native American lithic scatter site. Historic structures consist of an evaluated inventory of all prehistoric and historic structures with historical or architectural significance. The Preserve contains more than 100 structures, with 12 structures on List of Classified Structures. The Kelso Depot is listed on the List of National Historic Landmarks and is located near one of the proposed intersection upgrades (Site 4), and these roads would be affected. Therefore cultural resources will be an impact topic in the EA.

Federally Listed Species and Species of Special Consideration/Wildlife. The Proposed Action may affect a federally listed species found within and adjacent to the project area. The Endangered Species Act (ESA) of 1973, as amended, requires an analysis of impacts on all federally listed threatened and endangered species. In compliance with Section 7 of the ESA, the NPS is consulting with the U.S. Fish and Wildlife Service (USFWS) with regard to the project's impacts on the desert tortoise (*Gopherus agassizii*; Mojave population), which is known to occur within the project area. This species and its critical habitat are likely to be affected by construction of the Proposed Action and are therefore addressed as an impact topic in this EA. The Proposed Action has the potential to affect wildlife or wildlife habitat within and adjacent to the project area through habitat-disturbing activities and incidental death or injury; therefore, wildlife is addressed as an impact topic in this EA.

Geological Resources/Soils. The Proposed Action would include widening, realigning, and rehabilitation of the roadways. These activities would cause disturbance outside the existing roadway limits. Because the Proposed Action involves ground-disturbing activities on previously undisturbed areas, geological resources/soils are addressed as an impact topic in this EA.

Water Resources. Executive Order 11988, Floodplain Management, requires all Federal agencies to take action to reduce the risk of flood loss, to restore and preserve the natural beneficial values served by floodplains, and to minimize the impact of floods on human safety, health, and welfare. The proposed low water crossings at Sites 6 on Cedar Canyon Road and the proposed bank armoring at Site 8 on Black Canyon Road are within floodplains. Federal Highways reviewed these areas and provided a Preliminary Hydraulic Report indicating that these washes constituted waters of the US. Therefore, water resources are addressed as an impact topic in the EA.

Transportation. Road safety will be improved at eight locations within the Preserve, improving access to campgrounds and recreational areas. The Proposed Action would impact transportation and vehicular safety by affecting the safe movement and travel speed of vehicles through the project area, and traffic circulation. A safe road network ensures that vehicles have adequate sight distances at corners, intersections, and parking areas; minimizes the possibility for conflicts among motorized vehicles, pedestrians, and bicyclists; and that allows for vehicles to easily stay within their travel lanes. The effect of the Proposed Action on transportation is addressed as an impact topic in the EA.

Vegetation. The Proposed Action would likely affect vegetation resources within and adjacent to the project area through vegetation removal, relocation, and revegetation. Vegetation within the sites is sparse, and typically consists of species found in arid environments, such as Mojave creosote bush scrub on alluvial fan biota. Vegetation resources affected could include rare and unusual vegetation, as well as the potential spread of non-native plant species; therefore, vegetation is addressed as an impact topic in this EA.

Visitor Experience/Public Safety. Visitor experience and recreation opportunities may be affected during the Proposed Action construction period. Potential impacts may include road diversions, parking pullouts, and hiking and wildlife /bird-watching from the road. Visitor use/experience and public safety are addressed as an impact topic in this EA.

Issues and Impact Topics Considered but Dismissed

The following impact issues are identified as typical topics for analysis in a NPS EA. The project team determined that the following resources would not be affected by the proposed project, or it was determined that issues associated with these topics would result in negligible or minor impacts. Minor to negligible effects are localized impacts that would be below or at the lowest level of detection and barely measurable, relative to existing conditions, and would have no appreciable consequences. Therefore, these issues were dismissed from further analysis. The rationale for dismissal is given below.

Air Quality. Both the Clean Air Act of 1977 and NPS Management Policies (2006) require NPS to consider air quality impacts from their projects. The Preserve is designated as a Federal Class II Airshed under the Clean Air Act. Air pollutants are generated in the Preserve and are primarily from railroads, automobiles and dust. Automobile exhaust and the emissions from diesel generators contribute minor amounts of pollutants and greenhouse gas (GHG) emissions. The NPS has formed a partnership with the EPA to collaborate on controlling GHGs and climate change. This program is called the Climate Friendly Parks Program, which provides management tools and resources to address climate change. The program approach involves measuring existing emissions, developing strategies to mitigate emissions and adapt to impacts, sharing information, and educating the public about measures they can use to lessen their effect on climate change. GHGs emitted from the project area would consist of truck and equipment exhaust. Best Management Practices would be implemented to reduce emissions to the greatest extent possible. Construction within the Preserve associated with the Proposed Action would result in short-term, minor impacts to air quality, and mitigation measures described would further reduce impacts; therefore, air quality has been dismissed as an impact topic in this EA.

Climate Change. In November 2013, President Obama signed Executive Order 13653, Preparing the United States for the Impacts of Climate Change and established a Task Force on Climate Preparedness and Resilience to guide the Federal government in responding to the impacts of climate change. In response to this national priority, the National Park Service has developed both a NPS Climate Change Response Strategy and Climate Change Action plan to help parks effectively plan for and respond to climate change. The NPS has a mandate and obligation to curb the carbon pollution that is driving climate change; we must also improve our ability to prepare for existing climate impacts. Our actions, however seemingly small, make a difference in contributing to or reducing the effects of climate change.

Climate change creates impacts to resources at many levels, from biomes to individual species. For example, global climate change and drought are potentially important long-term considerations with respect to recovery of the desert tortoise (USFWS, 2014). While little is known regarding specific direct effects of climate change on the desert tortoise or its habitat, predictions can be made about how global and regional precipitation regimes may be altered and about the consequences of these changes. Generally, climate change predictions for the geographic range of the Mojave desert tortoise suggest a 3.5 to 4.0 degree Celsius (6.3 to 7.2 degree Fahrenheit) increase in annual mean temperature, with the greatest increases occurring in

summer (June-July-August mean up to 5 degrees Celsius [9 degrees Fahrenheit] increase). Precipitation is predicted to decrease by 5 to 15 percent annually within the range of the desert tortoise with winter precipitation potentially decreasing up to 20 percent. Because germination of the tortoise's food plants is highly dependent on cool season rains, the forage base could be reduced due to increasing temperatures and decreasing precipitation in winter.

Researchers at Washington State University have found that desert soils take up an unexpectedly large amount of carbon as levels of carbon dioxide increase in the atmosphere. The findings come after a 10-year experiment in which researchers exposed plots in the Mojave Desert to elevated carbon-dioxide levels similar to those expected in 2050 (Evans, R.D., et.al.; *Nature Climate Change* vol. 4, 394-397 (2014)). A total of approximately 10.65 acres of new disturbance will be required from this project. This disturbance will result in a small net loss of desert soil. However this net loss is negligible compared to the 1.6 million acres within the boundaries of the Mojave National Preserve. In addition, this disturbed area will be restored through revegetation activities after completion of the project. Impacts to soils will be discussed under the Geology/Soils section.

Another aspect of addressing climate change is strengthening park's resilience to extreme weather and prepare for other impacts of climate change. Climate changes will likely affect winter precipitation patterns and amounts in the Preserve, and could increase the frequency and magnitude of flood events that wash out roads, particularly over the 30-year lifespan of these road improvements. By reinforcing roads adjacent to washes and hardening low water crossings, the NPS is taking steps to provide protection from extreme weather and other climate impacts by investing in more resilient infrastructure, and facilitating a more rapid recovery from inevitable damages.

Because the project would emit only a minor amount of emissions over the short construction period, would restore areas disturbed by construction, and increase the park's resilience to some climate change impacts, this topic has been dismissed from further analysis.

Environmental Justice. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, requires all Federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. No impacts to minority or low income populations or communities are anticipated. Environmental justice was therefore dismissed as an impact topic in this EA.

Ethnographic Resources. Ethnographic resources are the cultural and natural features of a park that are of traditional significance to traditionally associated peoples. Ethnographic resources are defined by NPS as a "site, substance, object landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (Director's Order [DO] 28). Executive Order 13007 directs federal land managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites. Specifically, Federal agencies are directed to (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and (2) avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites. According to DO 28 and Executive Order 13007 on sacred sites, NPS should try to preserve and protect ethnographic resources. Because

no known ethnographic resources were identified that would be affected by the Proposed Action, ethnographic resources were dismissed as an impact topic in this EA.

Geohazards/Natural Hazards. Seismic activity in the Preserve exists due to strike slip fault zones in the vicinity, including the San Andreas to the west of the Preserve boundary. The Proposed Action will not impact seismic activity in the Preserve nor would it increase damage to park infrastructure from seismic events than would occur currently. Geohazards/natural hazards have therefore been dismissed as an impact topic in this EA.

Hazardous Materials. The GMP states that there are numerous potential hazardous material sites within the Preserve. These locations are primarily related to mining activities where chemical processing took place, as well as illegal dumping or clandestine drug lab activities. Investigations have occurred at Morningstar Mine, Sterner Claims (Rainbow Wells and Columbia Mine), Telegraph Mine, and Hole-in-the-Wall. None of these locations are near the project sites. The project sites have previously disturbed by prior road work. MOJA staff report that there are likely no hazardous substances at in the land adjacent to the roads (Burdette, 2014). FHWA consulted with Union Pacific who had no reports of any hazardous substance spills on railroad property in the project sites. A hazardous spill plan would be approved by the park prior to construction. This plan would state what actions would be taken in the case of a spill, notification measures, and preventive measures to be implemented, such as the placement of vehicles and generators. Since it is unlikely any that hazardous materials exist at the proposed project sites, this topic has been eliminated as an impact topic in the EA.

Historic Resources. As described in the GMP (2002), the Preserve contains an impressive inventory of historic resources related to the development of the American West. They include sites associated with Native American migration, early Spanish and American exploration of the region, and remnants of abandoned settlements, mining operations, transcontinental transportation and communications corridors, modern military operations and recreational development and tourism sites from the early 20th Century. None of the project sites associated with the Proposed Action would impact any of these resources: therefore, historic resources have been dismissed as an impact topic in this EA.

Land Use. All project sits are within the boundaries of the Preserve. All are public lands with one exception. If the NPS acquires access by way of fee simple or right of way purchase to make improvements at Site 5, some privately owned land within the authorized park boundary could become public. Any such transaction would be minor due to the small acreage (approx. 4 acres) and include compensation. Therefore, it was dismissed from further analysis in the EA.

Lightscares and Night Sky. The Proposed Action does not include any new lighting or night work; therefore Lightscares and Night Sky were dismissed as an impact topic in the EA.

Museum Collections. NPS requires the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material), and provides further guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, NPS museum collections. No activities would occur under the Proposed Action that would affect the management of existing museum collections or the collections themselves; therefore, museum collections were dismissed as an impact topic in this EA.

Preserve Management/Operations. Preserve management and operations are activities required to manage and operate the Preserve's infrastructure on a daily basis. Buildings, roads, trails,

utilities, and campgrounds require a range of operational activities from basic sanitation to trash pickups to water testing. Roadways require regular maintenance to repair cracks, potholes, roadway edges, and soft shoulders. Preserve management and operations practices are described in numerous documents including General Management Plan (2002); Fire Management Plan (2004); Business Plan (2007); MOJA Foundation Document (2013); and Water Resources Management Plan (under development), among others.

The Proposed Action would have short-term minor adverse effects on Preserve management/operations and largely beneficial long-term effects. Temporary disruption to Preserve operations would result from the construction required to improve roadway elevations, grades, curvature, low water crossings, embankment protection, and sight distances, and the realignment of two intersections. There would be minimal impacts with occasional lane closures, although during construction at Sites 1 and 2, Kelbaker Road would be temporarily closed from Kelso to I-15, which could impact staff working in the Preserve. Mitigation measures under the Proposed Action would reduce impacts and protect Preserve resources.

Beneficial long-term impacts would include reduced accident rates, improved parking and traffic circulation, lower roadway maintenance requirements, and less emergency roadway repair from storms, lowering Preserve costs. Because impacts would be minor and largely beneficial, Preserve Management/Operations was dismissed as an impact topic.

Prime and Unique Farmland. The Farmland Protection Policy Act (FPPA) was passed by Congress as part of the Agriculture and Food Act of 1981 (Public law 97-98). The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary of Agriculture. It may include lands currently used to produce livestock and/or timber. Unique farmland is land other than prime farmland that is used for production of specific high-value food and fiber crops, as determined by the Secretary. Examples of such crops include citrus, tree nuts, olives, cranberries, fruits, and vegetables. Prime and Unique Farmland under the FPPA does not include grazing lands. None of the proposed project sites involve Prime or Unique farmland, so this topic was dismissed as an impact topic in the EA.

Unique Ecosystems. Mojave National Preserve has several unique ecosystems including one for the federally endangered fish species, Mojave tui chub (*Gila bicolor mohavensis*) and Southwestern willow flycatcher (*Empidonax traillii extimus*). In the Preserve, the chub is found at Zzyzx near Soda Dry Lake and has been introduced into the pond at Morning Star Mine. The willow flycatcher occurs only at Piute Creek/riparian corridor on the far east side of the Preserve. These ecosystems are far removed from the proposed project; therefore unique ecosystems were dismissed as an impact topic in the EA.

Urban Quality/Gateway Communities. Gateway communities that drive through the Preserve will benefit from the improved roadways and signage; therefore Urban Quality/Gateway Communities was dismissed as an impact topic in this EA.

Socioeconomics. Construction activities and costs associated with the Proposed Action would provide a temporary stimulus to the local or regional economy. Wages, overhead expenses, material costs, and profits would last only as long as the construction period; therefore, impacts

to local communities and socioeconomic resources would be temporary. The Black Canyon Road crosses through the Gold Valley grazing allotment and abuts the Round Valley grazing allotment. The Proposed Action may temporally curtail the range of cattle movement during construction. The existing barbed wire fences on either side of Black Canyon road keep cattle out of the potential construction zones. As mitigation, ranchers will be notified and information pertaining to the construction timing will be provided so that grazing operations and allotments are not impacted. Impacts would be minor; therefore, socioeconomic impacts were dismissed as an impact topic in this EA.

Soundscapes. Noise is defined as unwanted sound. Construction activities related to roadway rehabilitation involve the use of noise-generating vehicles and equipment. Natural soundscapes in the area would be impacted by construction activities over the length of the Proposed Action; however, these impacts would be temporary and not expected to be more than minor. Noise impacts from the proposed rumble strips will be discussed under visitor resources. Noise impacts to federally listed species and species of special concern would be analyzed under that impact topic. The temporary nature of construction activity would not result in a chronic impact to the solitude and tranquility associated with the Preserve. Therefore, soundscapes have been eliminated from further analysis in this EA.

Visual Resources. Temporary construction equipment and additional machines staged along desert roads would impact visual resources in the short term. Machinery and construction equipment at the Kelso Depot would affect the visitor experience in the short term. Old sections of road will be reclaimed and revegetated to pre-construction conditions. However no long-term impacts will result from the proposed activity. Effects of signage and installation of speed feedback measures will be discussed under Cultural Resources. For this reason, impacts to visual resources were eliminated from further consideration.

Wetlands and Riparian Habitats. Federal waters of the U.S., including wetlands, have legal protection in accordance with the Clean Water Act (CWA) (33 U.S.C. Section 1344). Wetlands are defined for regulatory purposes as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (EPA, 40 CFR230.3 and USACE, 33 CFR 328.3). Wetlands are important ecological resources that perform many functions including groundwater recharge, flood flow attenuation and conveyance, erosion control, and water quality improvement. They also provide habitat for many plants and animals, including threatened or endangered species. Unless washes are saturated with water or covered with water for part of the year every year, they do not meet the definition of wetlands. A 2013 wetland field survey to determine wetland delineation, if applicable, was conducted in accordance with the *USACE 1987 Corps of Engineers Wetlands Delineation Manual* [hereby referred to as the “1987 Manual”] (*Environmental Laboratory 1987*) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* [hereby referred to as the “Supplement”] (*USACE, 2008*). The survey investigated potentially jurisdictional wetland and upland areas for the presence or absence of wetland hydrology, hydrophytes, and hydric soils. No wetlands or riparian habitats occur within the project area; therefore, wetlands were dismissed as an impact topic in this EA.

Wild and Scenic Rivers. There are no wild or scenic rivers in the proposed project area. Therefore, this was considered but eliminated from further analysis in this EA.

Wilderness. The Wilderness Act of 1964 is well known for its succinct and poetic definition of wilderness: “A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.”

The National Wilderness Preservation System (NWPS), created by the Wilderness Act, protects federally managed wilderness areas designated for preservation in their natural condition.

Activity on formally designated wilderness areas is managed by four federal land management agencies: the NPS, the US Forest Service, the US Fish and Wildlife Service, and the Bureau of Land Management. For the purpose of applying NPS policies, wilderness includes the categories of eligible, proposed, recommended, and designated wilderness. Potential wilderness may be a subset of any of these categories. The five qualities of wilderness character are Untrammelled, Undeveloped, Natural, Solitude or a Primitive and Unconfined Type of Recreation, and Other Features of Value. The Mojave National Preserve offers exceptional access to remote, wild places and provides a unique sense of discovery for visitors through its 1.6 million acres. This has permitted a full range of biological diversity of native species representative of the eastern Mojave Desert ecosystem to flourish minimally disturbed by humans in the Preserve.

Improvements to road safety will facilitate easier access to wilderness areas in Mojave National Preserve resulting in, therefore, increased visitation and increased human presence to the Mojave Wilderness. This is a benefit to the Preserve and visitors, as access to wilderness is within the Preserve's mission as defined in the enabling legislation.

The project was designed so that there would be no disturbance of any wilderness area. The proposed sites do not occur within designated wilderness. Where Wilderness areas are adjacent to a paved road, the boundary is defined as a 100 foot offset from the center of the road. Construction activities would occur entirely within this 200 foot wide existing road corridor. Construction activities would not directly encroach upon any of the designated wilderness areas within the Preserve. All staging of equipment will be on disturbed land or roadway outside of wilderness. There are no public trails or viewing points being developed at the project sites, nor are there any public trails in wilderness near any of the project sites. Noise from the construction would not interrupt visitors' wilderness experience. No long or short-term impacts to wilderness would occur; therefore it was considered but eliminated from further analysis in this EA.

CHAPTER 2: ALTERNATIVES

DEVELOPMENT OF ALTERNATIVES

This chapter describes two alternatives that have been developed for the Reconstruct Road Segments to Improve Safety Project for Mojave National Preserve. Alternatives for this project were developed primarily to resolve safety issues on Preserve roadways, and to enhance visitor use and experience.

The No Action alternative (Alternative 1) describes continuing the present roadway management and maintenance. The Proposed Action (Alternative 2) presents improvements to address the safety issues in the Preserve identified in Chapter 1. The designs for the eight project sites (shown on Figure 5) described as part of the Proposed alternative were developed by the FHWA, which evaluated potential roadway safety improvements within the Preserve in a scoping report (FHWA, May 2013), and prepared preliminary (30% and 70%) design drawings (FHWA, November 2013, March 2014) that provide the basis for this EA. Their analysis identified the improvements included in the projects as the most appropriate, cost-effective measures available to improve safety. Multi-day project scoping and development meetings were held on site with FHWA, NPS park and regional office staff, and the environmental consultants who authored this EA. Areas of expertise of meeting participants include facility and road management and maintenance, road design, pavement engineering, hydrology, archaeology, wildlife biology, vegetation, cultural resources, landscape architecture, and NEPA compliance. Alternatives were sketched and verbally proposed and visualized on site and ideas and concerns discussed. Designs that balanced public safety and reduced the impacts on park resources were further developed into engineered drawings by FHWA, and incorporated into the Proposed Action. Other action alternatives that did not reduce the risk to motorists were not developed; neither were alternatives that had excessively large impacts with no substantial increase in safety. These other alternatives would not have met the objectives of the project therefore, only two alternatives, No Action and the Proposed Action, are analyzed in this EA.

Almost all of the road design projects in the Proposed Action meet the AASHTO (American Association of State Highway and Transportation Officials) standards for a design speed of 55 mph, the current posted speed limits at the project sites. A design exception has been documented to adapt a two-foot paved shoulder, less than the three-foot shoulder called for in the standards. Minimizing the pavement width also reduces the impacts created by altering cut or fill slopes to accommodate changes in the vertical road alignment. Discussion centered on whether the wider shoulders would appreciably improve vehicle safety or if it would allow drivers to more easily see and avoid wildlife. The wider shoulders were determined to have a marginal improvement in safety for both vehicles and wildlife and designers concluded that it is preferable to minimize habitat disturbance instead.

The following sections also define mitigation measures for the action to address potential impacts, a description of alternatives considered and dismissed from detailed analysis, and a summary table comparing the environmental consequences of each alternative.

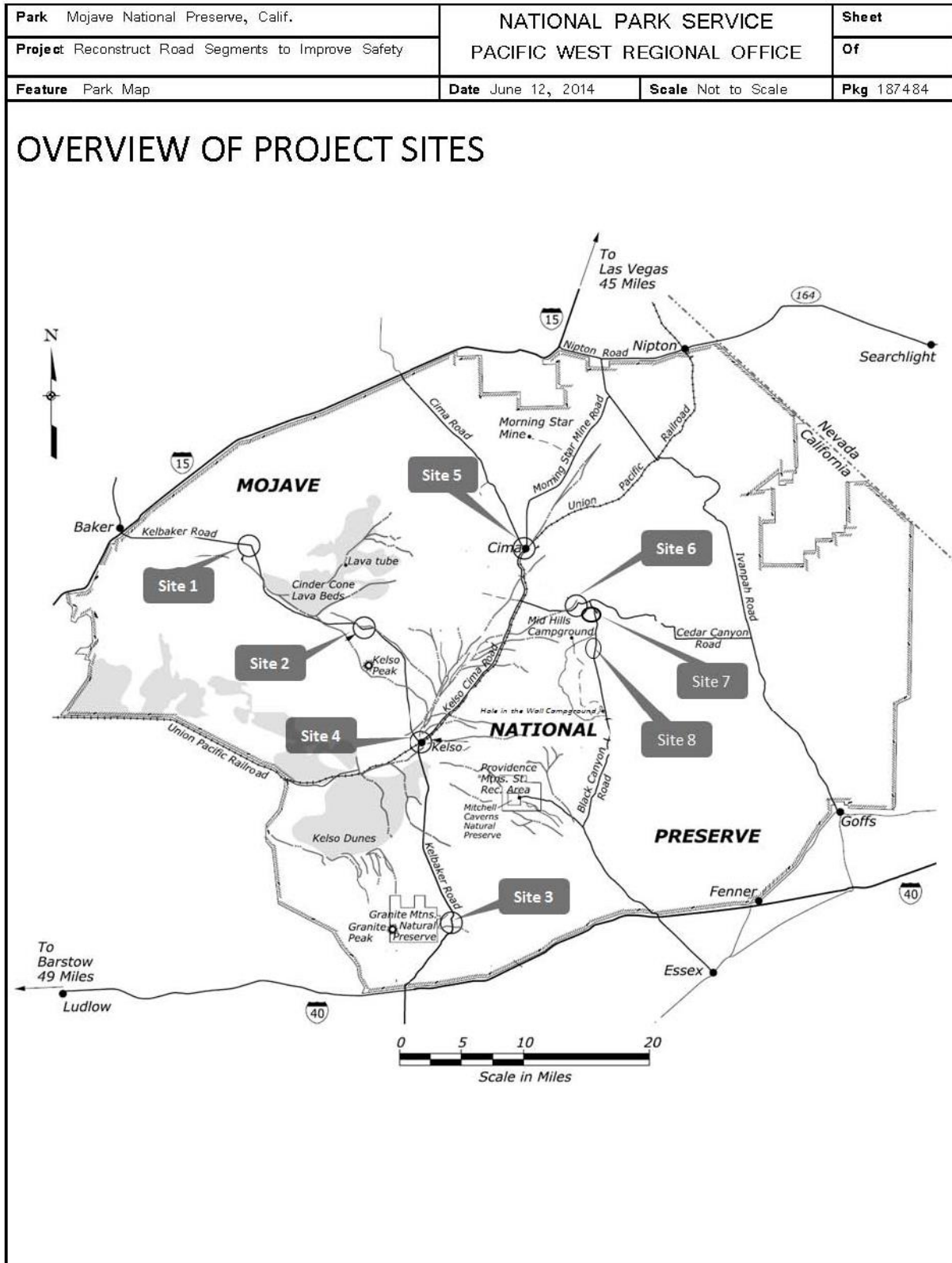


Figure 5: Index Map Showing Project Sites Within Mojave National Preserve

Alternative 1: No Action Alternative

The No Action Alternative provides a basis for comparing present Preserve operations with the action alternative. The No Action Alternative maintains the status quo. Under this scenario, the roads of Mojave National Preserve will remain in their current condition and configuration. The Preserve's routine of maintenance and repairs would continue. The existing use and maintenance of roadways would continue as is, and the current structural and safety issues would remain.

At the locations identified as having dangerous intersections and geometric deficiencies in the road, motorists will continue to have traffic accidents resulting in vehicle rollovers, injuries, and fatalities. None of the safety issues associated with the sharp curves, abrupt grade changes, poor sight lines and distances, or other concerns would be addressed.

No improvements would be made to Black Canyon Road or the low water crossings on Cedar Canyon Road. These roads would continue to be inundated with water during flood events and sustain major road damage. After storm damage occurs to these sections of roads, Preserve maintenance staff would complete repairs as done currently. Access to/from Mid Hills and Hole-in-the Wall could be impassable, visitors and park residents could be stranded within the park, and there would be hazardous driving conditions until repairs have been completed.

The No Action Alternative also includes continuation of current management and road maintenance practices to improve safety within the Preserve. This may include measures such as installation of speed limit and other traffic signs, flashing beacons, radar speed feedback signs or roadway striping and marking as appropriate. Preserve staff would educate visitors to the dangers of exceeding speed limits, by posting information on the Preserve website, at the visitor centers, and other park publications or meetings. Speed limits would be enforced throughout the Preserve as is done currently.

Alternative 2: Proposed Action

Alternative 2 is the Preferred Alternative. It proposes to make physical improvements to eight sections of dangerous roadway (Figure 5). Detailed descriptions and large scale aerial photos with schematic drawings of the proposed projects at each site are presented below.

Site 1: Kelbaker Road Curve Alignment

The long straight stretch of Kelbaker Road east of Baker is interrupted by a sharp curve with substandard superelevation would be realigned to match the 55 mph design speed for the road. Approximately 1650 feet of roadway would be realigned to form a more gradual horizontal curve with a larger radius (Figure 6). The grade profile would be leveled during the realignment to flatten the road and remove dips. The centerline and edge line would be restriped. Center line, and edge line, and transverse rumble strips would be installed to warn motorists of the upcoming curve and to slow down, and to alert drivers when they drift from their lane of traffic.

The realigned portion of roadway would be 22 feet wide with two-foot shoulders. Approximately 2,000 cubic yards of roadway would be excavated and 1,800 cubic yards of aggregate would be used as base fill. The existing road occupies 1.3 acres, 0.6 acres of which will be reclaimed and revegetated, and the remainder of which overlaps the new road alignment. The total area of new disturbance for this site is 1.7 acres. Approximately 0.25 acres of the existing roadway and adjacent existing disturbed areas would be used for staging. The turnoff to a connecting backcountry access road would be realigned on currently disturbed land, and the apron paved.

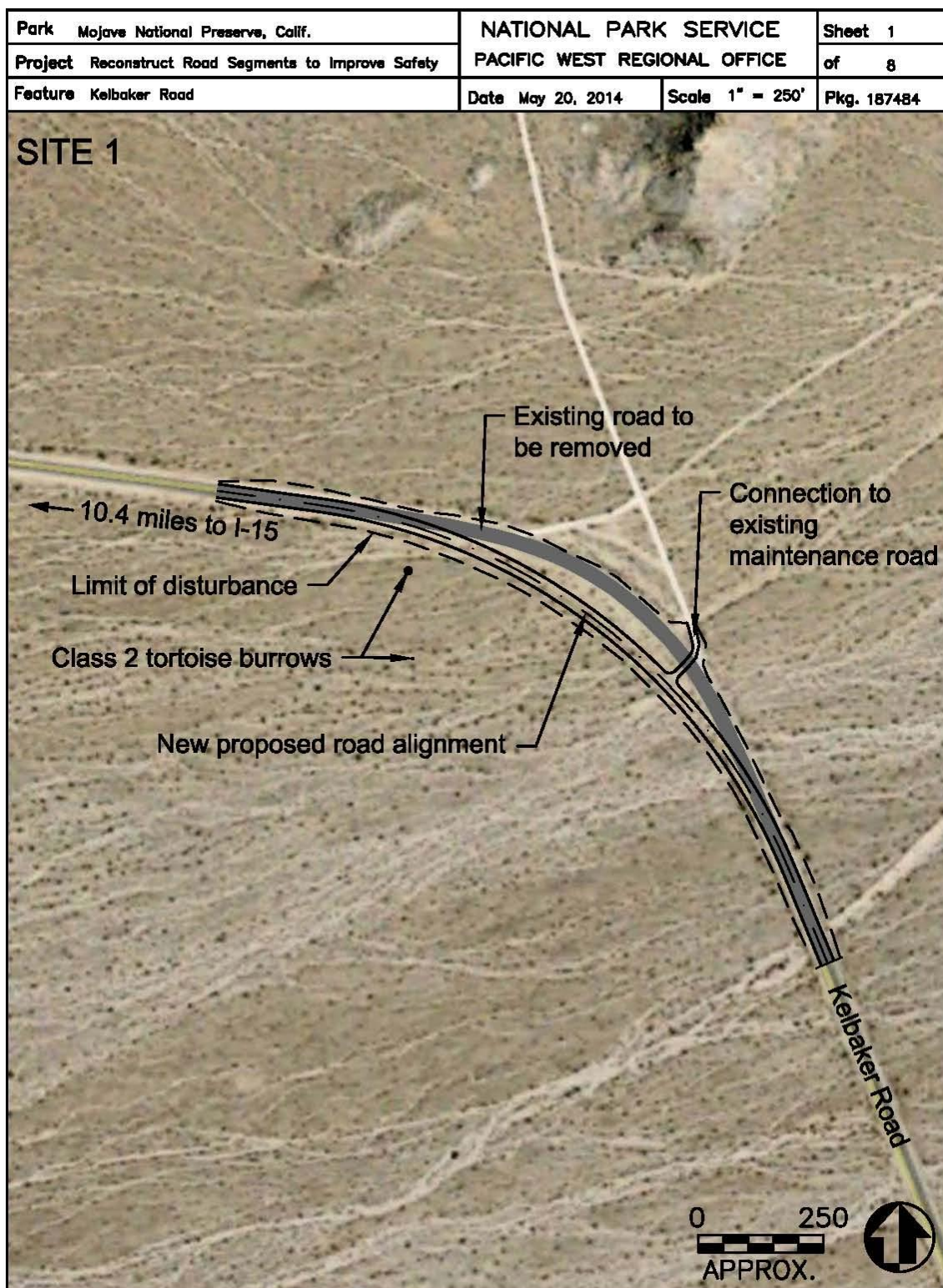


Figure 6: Kelbaker Road Curve Realignment near Baker CA (Site 1)

At the discretion of NPS, a variety of native plants may be removed, stored in temporary nurseries, and relocated to reclaimed areas, both during the project and following completion of the project. Revegetation work would use soil conserved along the corridor and native species from genetic stock originating in the Preserve. Revegetation efforts would also attempt reconstruction of the natural spacing, abundance, and diversity of native plant species.

The newly disturbed areas during construction would be revegetated through use of locally collected plant species (seeds and transplants). Control of non-native and invasive plant species would occur before and after construction activities.

Site 2: Kelbaker Road, Kelso Pass Alignment

Approximately 3,600 feet of roadway would be reconstructed to realign curves, correct vertical alignment deficiencies (dips and peaks) within the curves, and improve the super-elevation (tilt) of the curves. The project would also improve signage and striping, and install centerline and edge line rumble strips. A cattle guard grate would be removed and salvaged for reuse. The realignment of the curves may result in a need to transplant one or more Joshua trees (see Figure 7). Large, mature Joshua trees at the site will be avoided and fenced off during construction. Wildlife crossing signs will also be installed.

The roadway width would be 22 feet with two-foot shoulders for a total of 26 feet paved width. Figure 8 shows the planned roadway modifications: about 11,000 cubic yards of roadway would be excavated and 4,000 cubic yards of aggregate used for road base. Excavated material would be used as fill and grading material at other project sites. The existing roadway at this site occupies approximately 2.7 acres, most of which is within the footprint of the new road alignment. The total new disturbance would be about 3.35 acres. Approximately 0.15 acres of previously disturbed area would be used for staging.

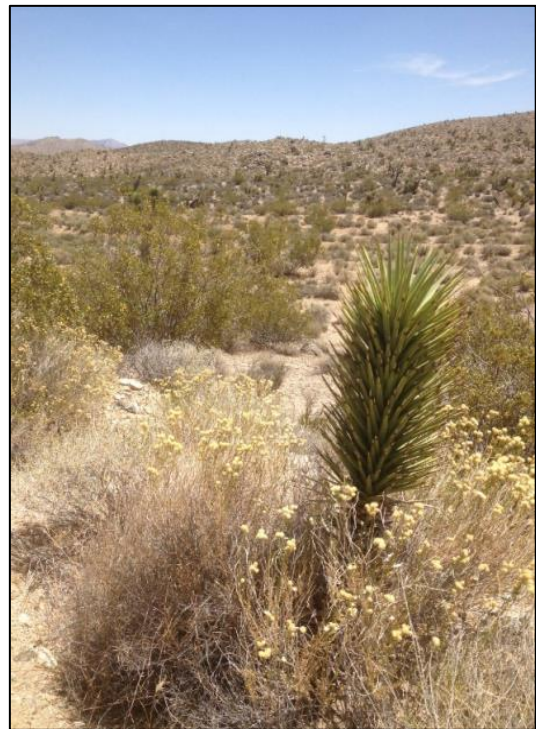


Figure 7: Small Joshua tree to be transplanted

At the discretion of NPS, a variety of native plants may be removed, stored in temporary nurseries, and relocated to reclaimed areas, both during the project and following completion of the project. Revegetation work would use soil conserved along the corridor and native species from genetic stock originating in the Preserve. Revegetation efforts would also attempt reconstruction of the natural spacing, abundance, and diversity of native plant species.

The newly disturbed areas during construction would be revegetated through use of locally collected plant species (seeds and transplants). Control of non-native and invasive plant species would occur before and after construction activities.

Site 3: Kelbaker Road, Granite Pass Alignment

Approximately 3000 feet of roadway would be realigned, regraded and reconstructed to correct a series of sharp curves and vertical dips and rises (Figure 9). The radius of curvature of the existing 30 mph and 45 mph curves would be realigned to provide safe driving conditions at the posted speed limit, and the vertical road alignment would be regraded to remove the abrupt grade changes.

Other improvements would include additional signage, speed feedback signs, flashing beacons, and transverse rumble strips. Wildlife crossing signs would be installed. Approximately 3.1 acres of desert vegetation, including three or four mature junipers, would be removed as part of the road realignment, and some plants may be salvaged and replanted in the reclaimed road area. In addition, the existing undersized culvert would be replaced with a larger diameter culvert.

The realigned portion of roadway would have two lanes 11 feet wide, with two-foot shoulders and edge line rumble strips. Approximately 9,000 cubic yards of roadway would be excavated and 3,500 cubic yards of aggregate would be used as base fill. The existing road occupies 2.5 acres, 0.3 acres of which would be removed, reclaimed and vegetated, and the remainder of which overlaps the new road alignment. The area of new disturbance at this site is approximately 3.8 acres. Approximately 0.2 acres of the existing disturbed area would be used for staging. In addition, the existing unimproved pullout would be converted to a paved parking area measuring approximately 48 x 70 feet (0.08 acre) for cars and RVs (see the detail in Figure 9). A berm would be constructed around the edge of the parking lot to prevent visitors from driving off the pavement.

At the discretion of NPS, a variety of native plants may be salvaged, stored in temporary nurseries, and relocated to reclaimed areas, both during the project and following completion of the project. Revegetation work would use soil conserved along the corridor and native species from genetic stock originating in the Preserve. Revegetation efforts would also attempt reconstruction of the natural spacing, abundance, and diversity of native plant species.

The newly disturbed areas during construction would be revegetated through use of locally collected plant species (seeds and transplants). Control of non-native and invasive plant species would occur before and after construction activities.

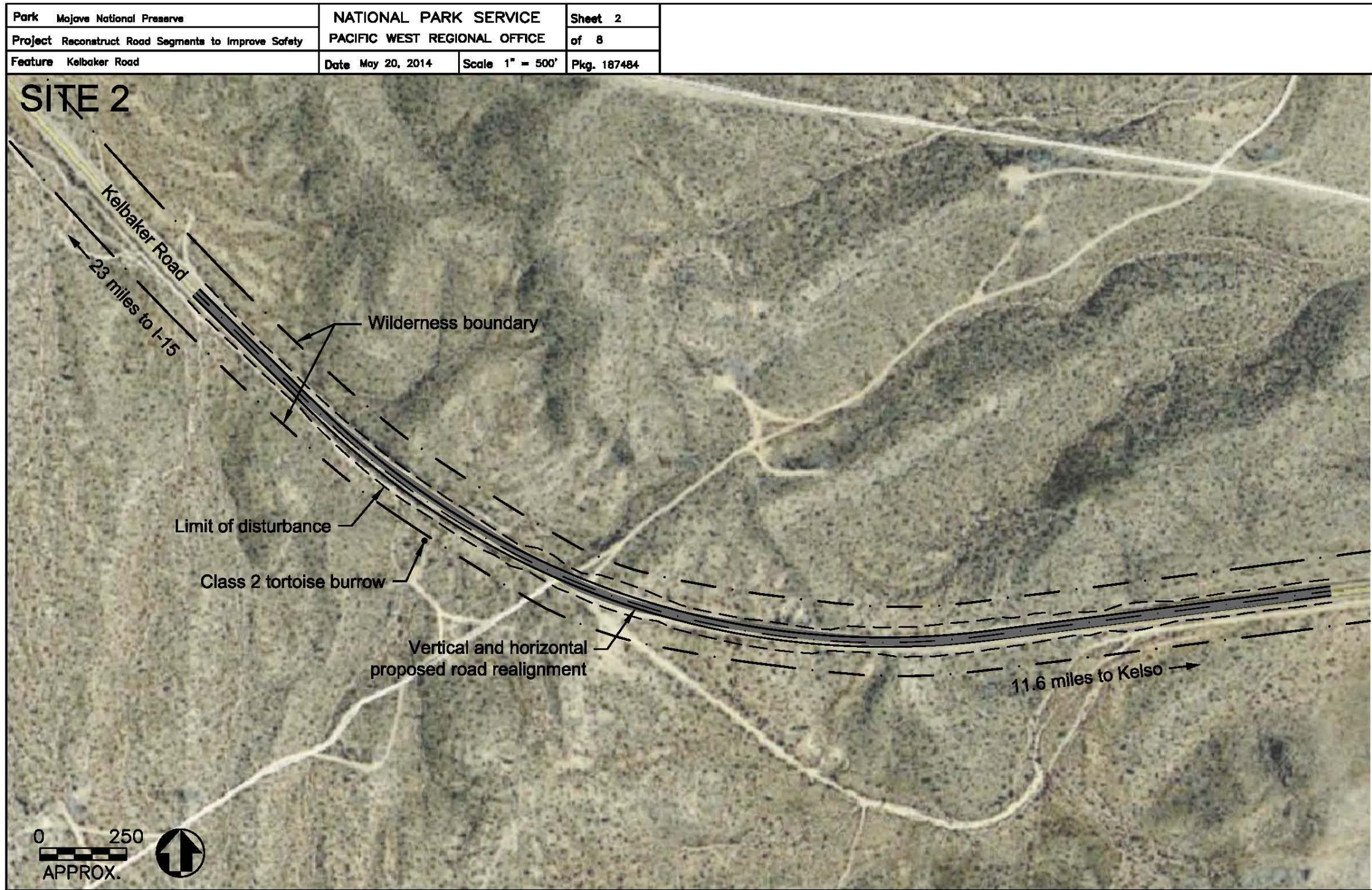


Figure 8: Kelbaker Road Curve Realignment at Kelso Pass (Site 2)

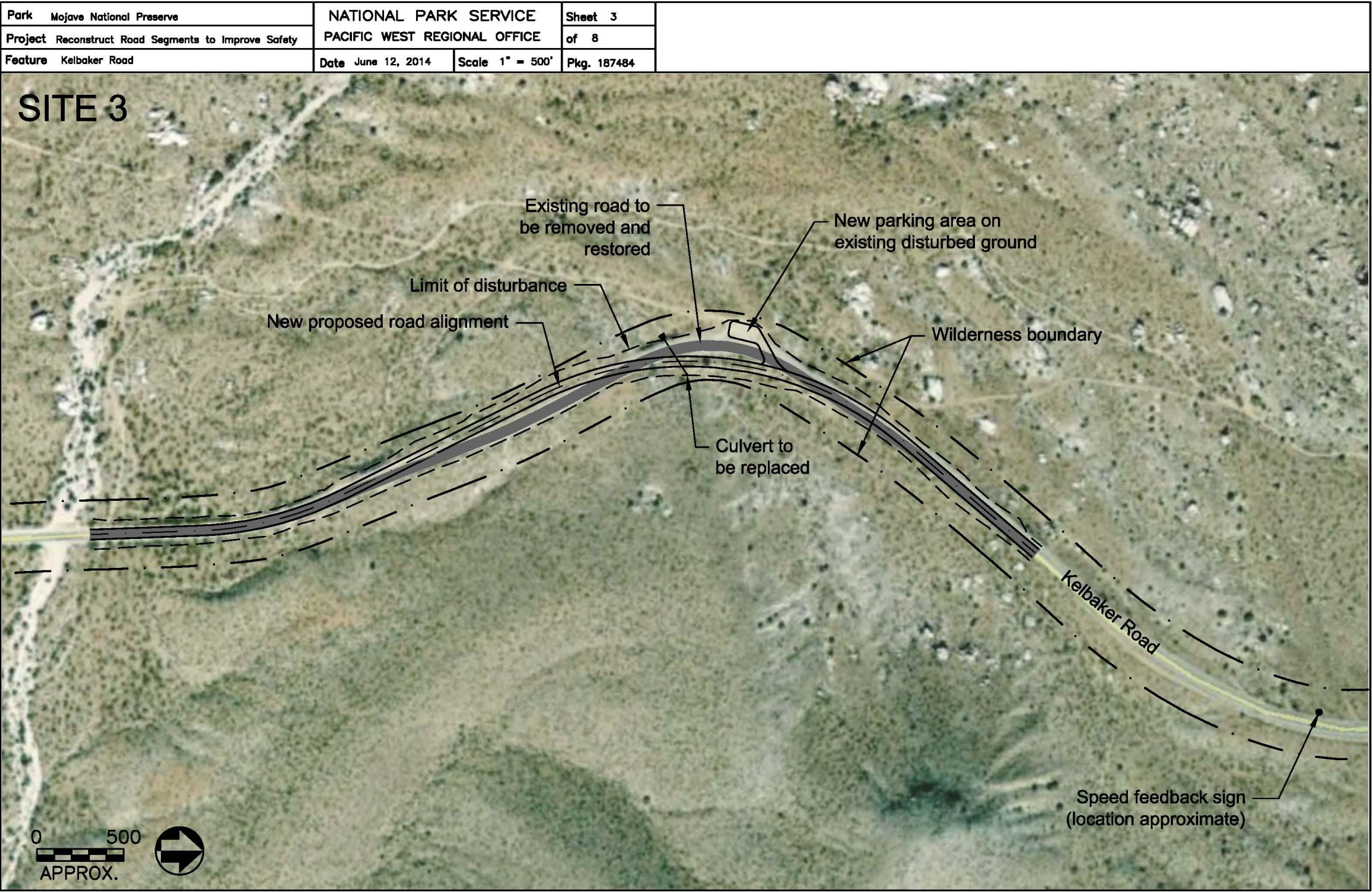


Figure 9: Kelbaker Road Curve Realignment at Granite Pass (Site 3)

Site 4: Kelbaker Road/Kelso-Cima Road Intersection

Kelbaker Road would be raised approximately three feet as it approaches the railroad crossing to improve sight lines and allow drivers to have a better view of the road ahead. There would be no change in alignment for Kelbaker Road.

Kelso-Cima Road would be moved approximately 50 feet to the northwest at the intersection of Kelbaker Road, to create more well defined “T” intersection with Kelbaker Road (Figure 10). The large expanse of asphalt and gravel in the existing intersection would be reduced. New asphalt curbs would be constructed on both sides of Kelso-Cima Road. These changes would allow for more space between the railroad crossing and the intersection to improve the line of sight in the Kelso Depot area. The realignment of Kelso-Cima Road would help clarify the traffic flow and slow down vehicles as they move through the intersection and pedestrian crossing. As a result, the informal gravel parking lot on the east side of Kelso-Cima Road would be eliminated. A speed hump would be installed on Kelso-Cima Road across from Kelso Depot, and approximately 400 feet from the intersection. In addition, installation of speed feedback signs and other speed slowing measures would promote slower speeds. The large visitor parking lot will also be repaved.

Approximately 400 feet of roadway would be realigned and regraded at this site. The roadway width would be standardized at 22 feet with two-foot shoulders for a total of 26 feet, including the removal of about 0.2 acres of asphalt on the east side of the intersection that would be reclaimed and revegetated. Approximately 800 cubic yards would be excavated and 400 cubic yards of aggregate road base would be used for the realigned and regraded road. The project would involve the reconstruction of approximately 1.1 acres of previously disturbed roadway. There would be 0.5 acres of new disturbance at this site, much of which is in a previously disturbed area. Staging would occur on 0.15 acres of previously disturbed area.

Site 5: Kelso-Cima/Morningstar Mine/Cima Road Intersection

The proposed work at this location includes raising the grade of the roadway between the railroad spur crossings, improved signing and striping, and possible realignment of Cima Road. Cima Road would be realigned to create a “T” intersection at a greater distance from the railroad crossing (Figure 11). These modifications would clarify the dominant through-traffic route and make it easier to see approaching vehicles. The realignment of Cima Road is dependent upon the Preserve acquiring access by way of fee simple or right of way purchase to make improvements on four acres at the site. If access cannot be acquired, the road would not be realigned into the “T” intersection, but other measures would be implemented as described.

The railroad spur line is located on Kelso-Cima Road approximately 70 feet south of the intersection and rises about five to seven feet above the road grade. The elevation difference between Kelso-Cima Road to the south and west of its intersection with Cima Road impedes the visibility of oncoming vehicles on Kelso-Cima Road. This situation reduces motorists' reaction time as they approach the intersection, increasing the risk of rear-end collisions.

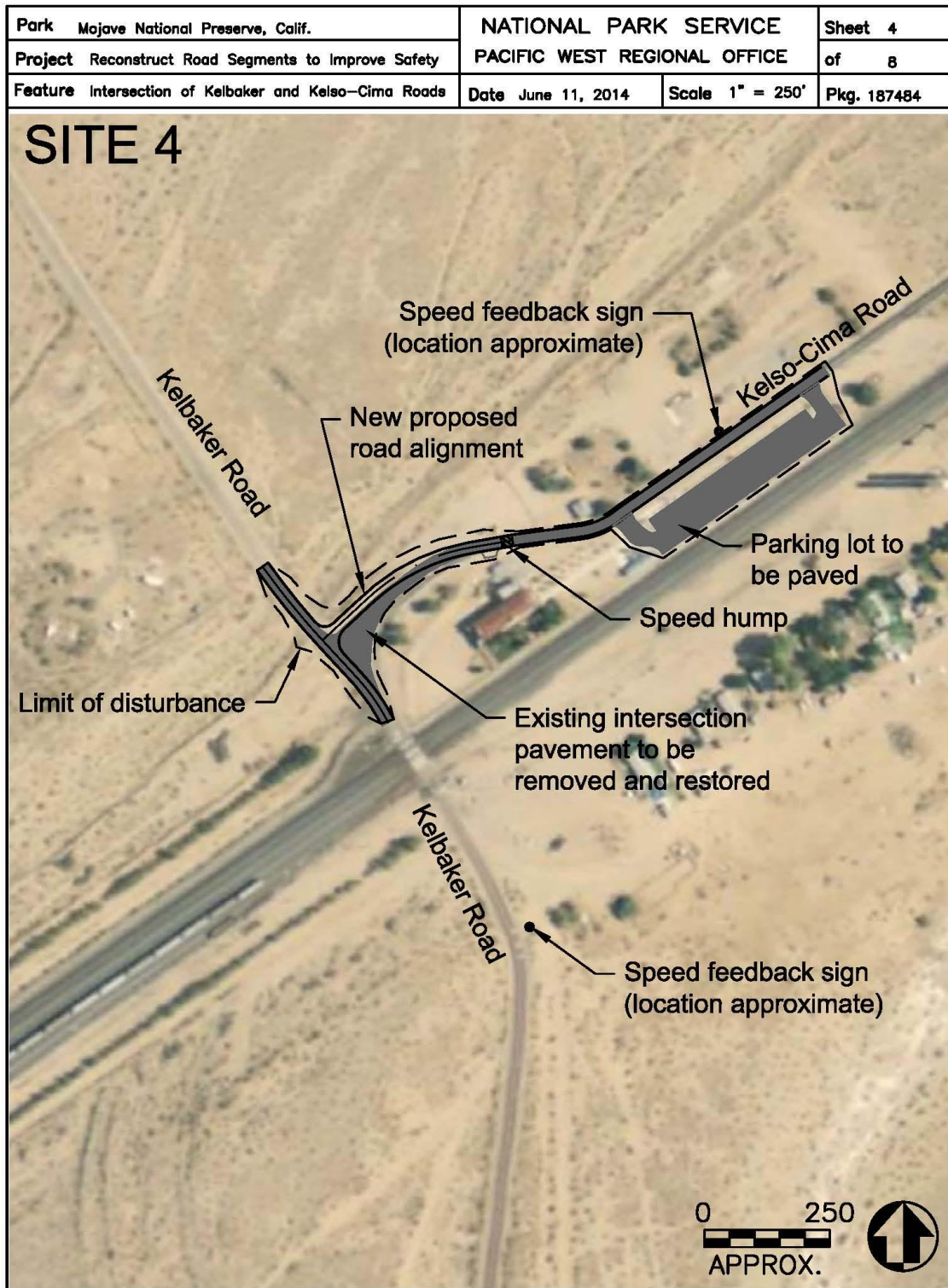


Figure 10: Intersection of Kelbaker Road and Kelso-Cima Road (Site 4)

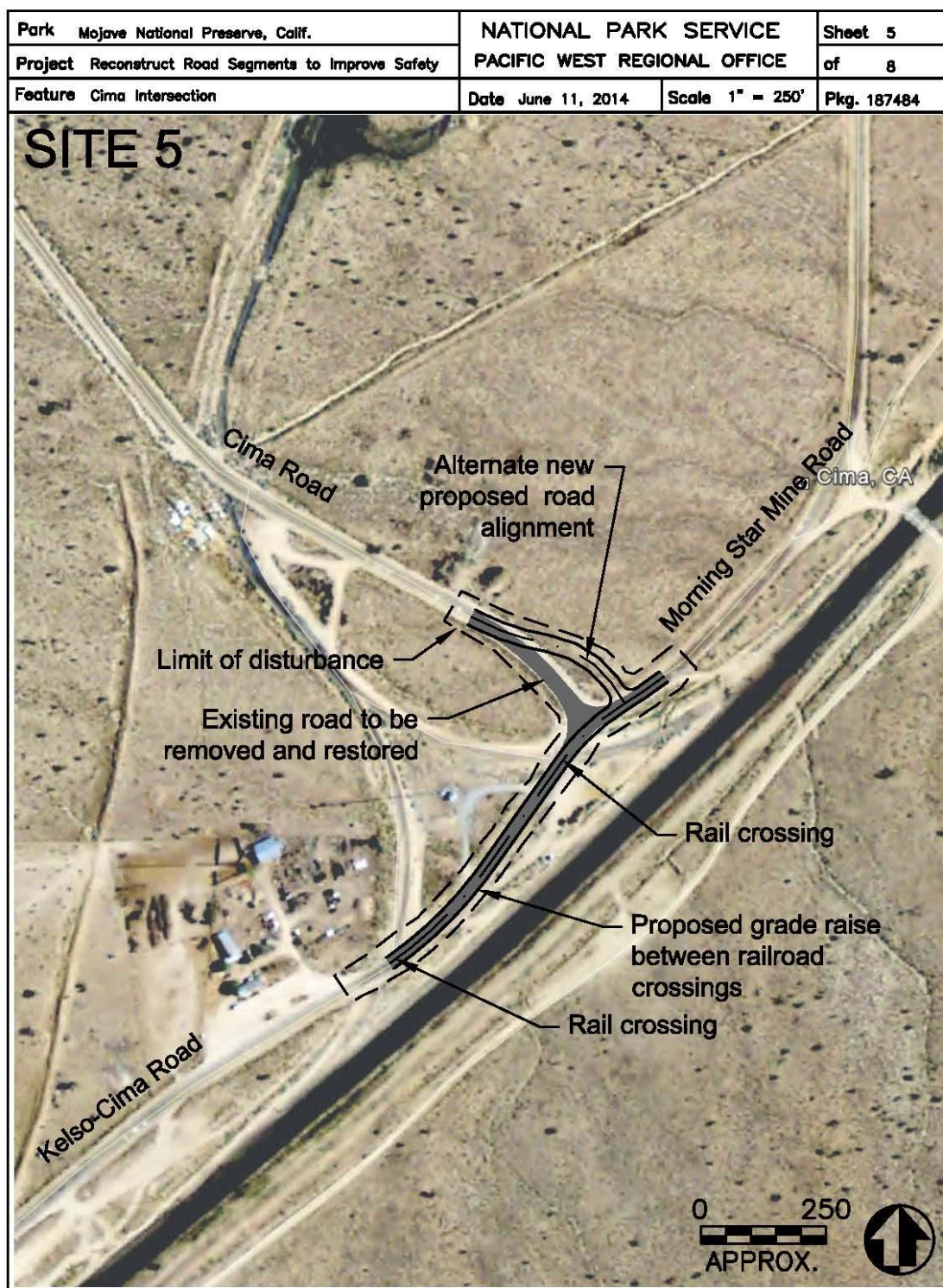


Figure 11: Intersection of Kelso-Cima, Cima, and Morningstar Mine Roads (Site 5)

The length of the modified roads would be approximately 800 feet on Kelso-Cima Road, and 380 feet on Cima Road. The realigned roadway width would be 22 feet with two-foot shoulders for a total of 26 feet. Approximately 380 cubic yards of roadway would be excavated and 150 cubic yards of aggregate would be used as base fill. The area of the existing road at this site is about 0.8 acres, approximately 0.2 of which would be reclaimed and revegetated if Cima Road was realigned and the remainder of which overlaps the new road alignment. The total area of disturbance at this site would be 1.8 acres, including 0.8 acres of existing vegetation, and one acre within the previously disturbed area adjacent to the road and railroad tracks, between the railroad crossings. Approximately 0.45 acres of existing disturbed areas would be used for staging. If Cima Road is not realigned, the existing intersection location would remain, no vegetation would be removed, and the new disturbance would be limited to the one acre within the previously disturbed area between the railroad crossings.

Site 6: Cedar Canyon Road, Low Water Crossings

To minimize damage from floods, the project proposes to pave two low water crossings (LWCs) 0.6 miles apart on Cedar Canyon Road with asphalt, and install riprap and buried concrete barriers (known as “Jersey Barriers”) on both sides of the LWC to reinforce the pavement against undermining. Figure 12 shows a typical LWC section. Figure 13 shows the planned location of the low water crossings. The design requires a transition of approximately 10 feet of disturbance downstream and upstream.

The pavement and barriers at the first LWC would be approximately 150 feet in length and 52 feet wide, with a 10-foot transition on both sides, for a total of approximately 170 feet of riprap. Riprap would be buried approximately two feet in the ground. The second LWC would be paved for a length of 130 feet, and a width of 52 feet, with 10 foot transition on both sides of the crossing, for a total of approximately 150 feet of riprap. There would be a total of 0.2 acres of disturbance at this site, all in areas that are previously disturbed. All staging would occur within the existing roadway or previously disturbed areas. The proposed improvements are designed to work well in desert wash conditions, and are designed to withstand a 25 to 50-year flood.

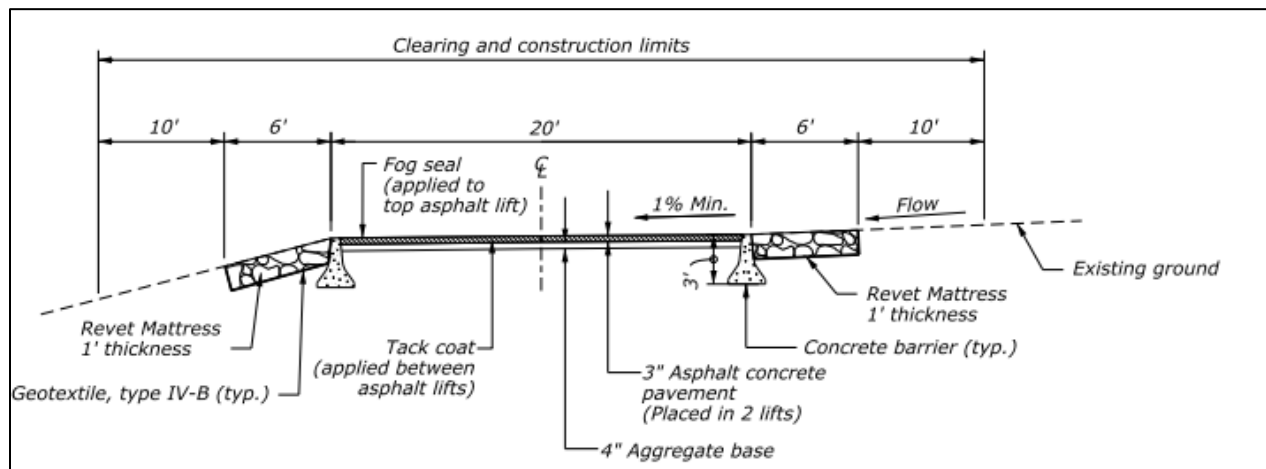
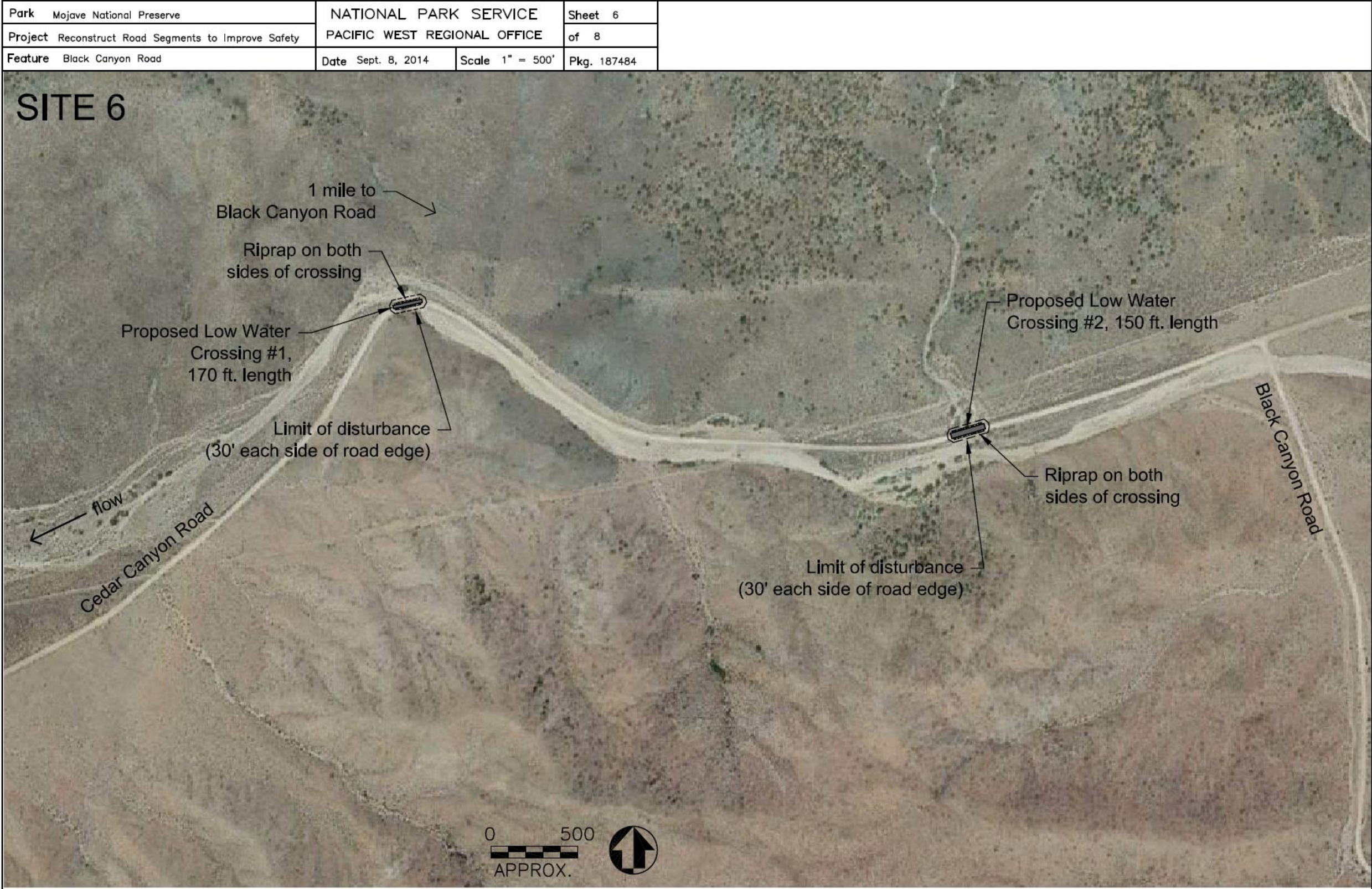


Figure 12: Typical Section of Low Water Crossing Design for Cedar Canyon Road



1
2 **Figure 13:** Location of Low Water Crossings on Cedar Canyon Road (Site 6)

Site 7: Black Canyon Road, Curve Improvement Site

In this location, a small curve with incorrect super-elevation (tilting) would be re-graded to prevent vehicles from sliding off the roadway as they go through the curve (Figure 14). In addition to road improvements, sign improvements would be installed to identify curves and reduce speed. This curve grading would not entail any work outside the existing roadway prism and would affect .21 acres of previously disturbed land. Staging would occur within the existing roadway or adjacent previously disturbed areas.

Site 8: Black Canyon Road, Slope Protection

On a section of Black Canyon Road which frequently washes out during storm events, riprap or gabions would be placed into the side of the road embankment adjacent to the wash to provide reinforcement against future storm-water damage. As shown on Figure 15, bank armoring would occur over a potential maximum length of approximately 7,000 feet and an area of about 2.9 acres of previously disturbed land. Staging would occur on the roadway, or on already disturbed land adjacent to the project. Slope armoring would be approximately five feet from the channel elevation to the top of the riprap (Figure 16). To the greatest extent possible, sections of the bank that are stable with existing vegetation would remain and not be disturbed.

Near the northern end of the bank protection work at this site, a 50 foot long low water crossing will be constructed to allow the drainage on the east side of the roadway to cross over into the main channel on the west side of the roadway. The roadway will be lowered about three feet to the existing channel elevation. Additional slope armoring will be placed at the NE, SE, and SW corners of the low water crossing to protect the roadway and assist in diverting the water across the roadway. No concrete barriers or asphalt pavement will be placed at this low water crossing.

Activities Common to All Sites

Certain activities would be conducted at each of the project sites to ensure that environmental impacts are avoided or minimized.

Traffic Control and Access. The construction contractor would have a traffic plan in place prior to construction. Flaggers would be used with an appropriate buffer space to direct traffic. Traffic delays would be expected to be limited to approximately 30 minutes or less.

Staging Areas. All staging areas would be on previously disturbed areas, existing road beds or disturbed pull outs. No staging would occur on previously undisturbed land.

Waste Material. It is anticipated that 6,000 cubic yards of waste material, consisting of existing road bed, would be generated from all the sites. To the greatest extent possible, existing onsite demolished materials, such as waste concrete and asphalt, may be recycled and reused to reduce waste and truck traffic. If it cannot be used onsite, the contractor would either recycle the material or dispose of it in an approved landfill.

Construction Methods. Road construction methods would include some or all of the following, depending on the site.

- Grading and excavation;
- Pulverizing existing pavement for use as aggregate base
- Placing new hot mix asphalt over the aggregate base;

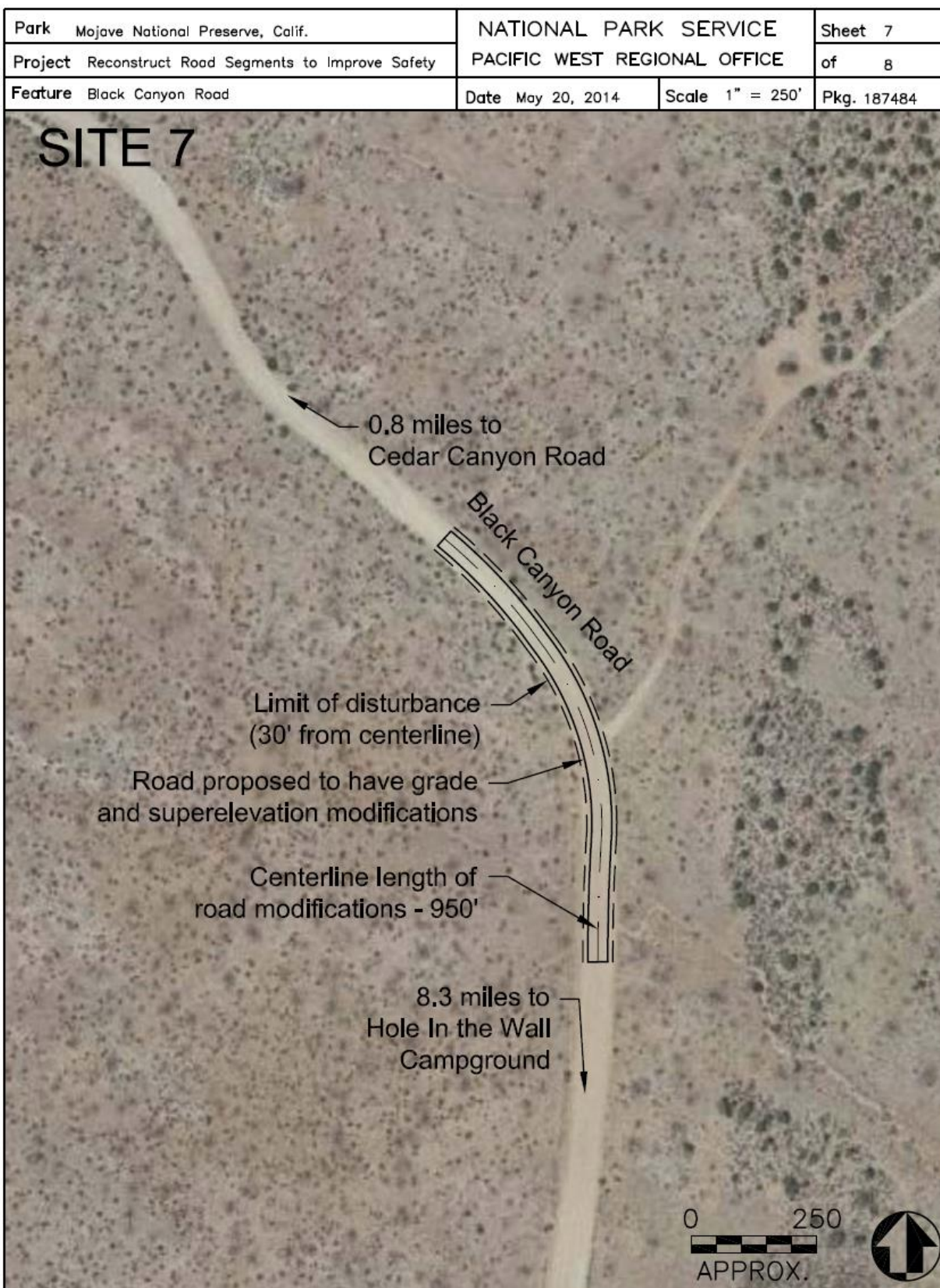


Figure 14: Roadway Improvements on Black Canyon Road (Site 7)

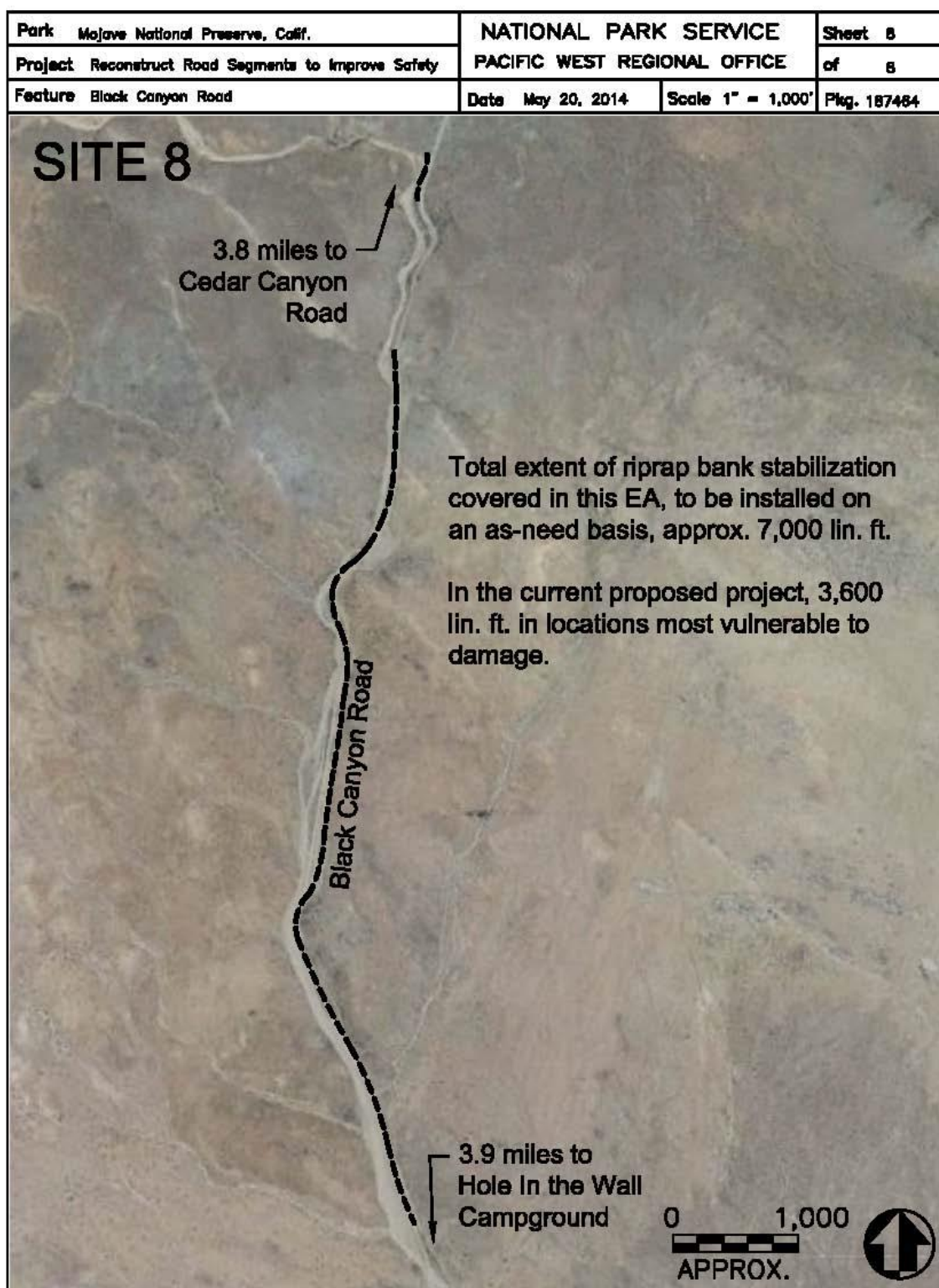


Figure 15: Black Canyon Road Bank Stabilization (Site 8)

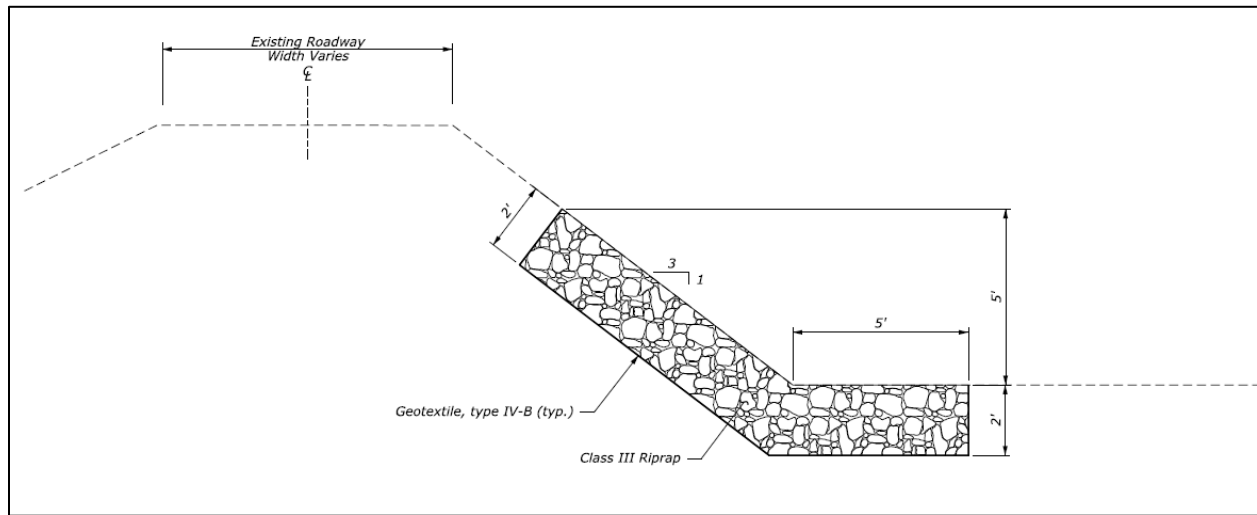


Figure 16: Typical Section of Planned Slope Armoring on Black Canyon Road

- Installing rumble strips;
- Installing traffic signage and striping;
- Installing short or long-term erosion control measures following approved best management practices such as wattles, silt fences, riprap and gabions;
- Implementation of measures to minimize risks to personal safety,
- Fencing of Staging areas to ensure no land or resources outside the disturbed area are impacted.

Construction Timing. Construction would occur over the course of the year, weather permitting. The project schedule would be determined by the contractor but would be carefully coordinated with biological resource protection and other restrictions outlined in the project mitigations.

Alternatives and Actions Considered But Dismissed

FHWA evaluated potential roadway safety improvements within the Preserve in a scoping report (FHWA, April 2013), and prepared preliminary (30%) design drawings (FHWA, November 2013) that provide the basis for this EA. Their analysis identified the improvements described above as the most appropriate, cost-effective measures available to improve safety while minimizing impacts to the park's resources.

Alternate Site 1 Alignment

At Site 1 on Kelbaker Road, the existing curve in the road has a radius of approximately 660 feet, which does not meet the AASHTO standards for the existing 55 mph speed limit of the road and has been the site of many single vehicle accidents. Excessive speed does contribute to the severity of the accidents at this site. In order to design the curve to accommodate a speeding driver at 80 mph, for example, the curve radius would need to be 2,670 feet. This would be a significant increase in habitat disturbance in order to accommodate a small percentage of unlawful drivers. This alternative curve radius was not further developed and is dismissed from further consideration. Included in the Proposed Action are sufficient improvements to the road

segment so that a lawful 55 mph driver can safely navigate the curves and the goal of the project has been met, but with a minimum of resource disturbance.

Alternate Site 3 Alignment

At Site 3 on Granite Pass, the project team also considered an alternative curve alignment with a radius of 1100 feet (the Proposed Action has a radius of 960 feet). The larger radius would better accommodate vehicles travelling at high speeds, but the new construction disturbance would be larger and would cross into the Wilderness area (100 feet from the existing road centerline). The new centerline would be approximately 300 feet east of the existing centerline. This alignment may also require the Preserve to redefine the boundaries of designated Wilderness near Kelbaker Road in order to comply with the Preserve's *General Management Plan*. This alternative was considered but dismissed because the increase in safety was negligible, compared to the impact to vegetation and wildlife of the larger area disturbance. This alternative was not further developed and is dismissed from further consideration.

Lowering Speed Limits and Increasing Enforcement (No construction)

Several scoping comments suggested lowering speed limits in the Preserve in lieu of realigning the roadway. Commenters postulated that there would be little or no need to redesign the roadways if slower speed limits were in place. Others felt that great law enforcement of speed limits would limit the number of motorists using the Preserve as a short-cut route through the desert, thus resulting in fewer accidents. As a result, the planning team assessed the feasibility of implementing these suggestions instead of completing any constructed modifications on the roads.

Traffic patterns in the Preserve are an ongoing concern. After reviewing studies performed by the NPS, California Department of Transportation (CalTrans) and the FHWA, the team found that research failed to demonstrate a connection between posted speed limits and actual vehicle speeds. For instance, the FHWA found that raising or lowering the speed limits did not affect vehicle speeds and that speed limits set too low to be accepted as reasonable by the vast majority of drivers would be ignored (FHWA, 1997).

The NPS also recently completed research on driver speeding habits in relation to desert tortoise mortality (Hughson and Darby, 2013). The study found that attempts to slow traffic with lower posted speed limits, increased law enforcement and improving driver awareness does not reduce driver speeds, or impacts to tortoise populations. Literature reviews conducted as part of this research revealed similar data. These findings provide a good correlation to this project and demonstrate the ineffectiveness of warning signs and lower speed limits on driver behavior.

Crashes are complex events that can seldom be attributed to a single factor. Although speeding contributes to accidents in the project areas, it is not necessarily the causative factor. The roads proposed for improvements in this EA have inherent physical flaws and were inadequately designed. These design deficiencies contribute to vehicle accidents under a variety of circumstances in addition to speeding.

Some drivers may incorrectly judge the capabilities of their vehicles (e.g., braking, steering) and do not anticipate roadway geometry and roadside conditions sufficiently to determine appropriate driving speeds. Inexperienced drivers or experienced drivers operating in unfamiliar surroundings may underestimate risk and make inappropriate speed choices. Even drivers

familiar with the roads can make inappropriate decisions because of fatigue, rushing to complete travel, or other factors (FHWA, September 2005).

Changing speed limits in the Preserve would require further engineering studies. The Proposed Action does not preclude the Preserve management from completing appropriate studies and reducing the speed limits, if appropriate, in the future. The Preserve has a limited number of Visitor and Resource Protection Rangers, whose responsibilities extend beyond speed enforcement. The number of staff is determined by the budget appropriated to the park by Congress. If and when the budget allows the hiring of additional rangers, park management could consider hiring more staff. This project also would not preclude this administrative action.

Physical changes on these sections of roads are required to make them safer. Lower speed limits or enforcing those limits would not completely solve the problem and fulfill the purpose and need of the project. Therefore, this alternative was rejected from further consideration.

Resource Protection/Mitigation Measures

In many cases, environmental impacts associated with the Proposed Action can be reduced or avoided by implementing specific resource protection mitigation measures. Table 1 summarizes mitigations planned for each category or resource type.

Table 1: Resource Protection/Mitigation Measures

Resource	Mitigation
General Measures and Considerations	<ol style="list-style-type: none"> 1. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone. This does not exclude necessary temporary structures such as erosion control fencing. 2. All tools, equipment, barricades, signs, and surplus materials would be removed from the project work limits upon project completion. Construction debris would be hauled from the Preserve to an appropriate disposal or recycling location. Any asphalt surfaces damaged due to work on the project would be repaired to original condition. All demolition debris would be removed from the project site, including all visible concrete and metal pieces. 3. Contractors would be required to properly maintain construction equipment (e.g., mufflers to minimize noise). 4. A hazardous spill plan would be put in place, stating what actions would be taken in the event of a spill and preventive measures to be implemented, such as placement of refueling facilities, storage, and handling of hazardous materials. 5. All equipment would be maintained in a clean, well-functioning state to avoid or minimize contamination from mechanical fluids. Equipment would be checked daily. 6. Material stockpiling, machinery storage, and vehicle parking would be permitted only in designated areas. 7. No lane closures would occur on weekends from Friday 6:00 P.M. through Monday 6:00 A.M. 8. No work will be performed on holidays except to maintain traffic control devices, erosion control devices, the roadway driving surface, and to control dust. 9. Work hours would be from dawn to dusk to avoid the potential for accidents after dark. 10. Weekday lane closures using one-way traffic control would allow the work to continue with minimal traffic safety concerns. 11. Any project-related vehicle or equipment operating on unpaved roads would not exceed a speed limit of 25 miles per hour. 12. No pets or firearms would be permitted inside the project's construction boundaries or other associated work areas at any time. 13. Ranchers will be notified and information pertaining to the construction timing will be provided so that grazing operations and allotments are not impacted.

Air Quality	<ol style="list-style-type: none"> 1. Construction activities would be coupled with water sprinkling to reduce fugitive dust emissions. Water sprinkling would occur as needed on active work areas where soil or fine particles are exposed. 2. Water will be obtained from Preserve sources, and trucked to project sites. 3. Idling of construction vehicles would be limited to reduce construction equipment emissions. Unnecessary idling of all construction vehicles would be avoided throughout the construction period.
Geological Resources – Soils	<ol style="list-style-type: none"> 1. Erosion and sediment control would be required. Best management practices for drainage and sediment control, as identified and used by the FHWA and the NPS, would be implemented to prevent or reduce non-point source pollution and minimize soil loss and sedimentation in drainage areas. Use of best management practices in the project area for drainage protection would include all or some of the following actions, depending on site-specific requirements: <ol style="list-style-type: none"> a. Keep disturbed areas as small as practical to minimize exposed soil and the potential for erosion. b. Locate waste and excess excavated materials outside of drainages to avoid sedimentation. c. Install silt fences, temporary earthen berms, temporary water bars, sediment traps, stone check dams, or other equivalent measures (including installing erosion-control measures around the perimeter of stockpiled fill material) prior to construction. d. Conduct regular site inspections during the construction period to ensure that erosion-control measures were properly installed and are functioning effectively. e. Only tightly woven fiber netting or nonbinding materials, shall be used for erosion control or other purposes at the project site to ensure that small mammals and reptiles do not become trapped. No plastic-tied wattles shall be used. 2. Store, use, and dispose of chemicals, fuels, and other toxic materials appropriately. 3. Revegetate disturbed areas as soon as possible after construction is completed.
Vegetation – Native and Non-native	<ol style="list-style-type: none"> 1. Vegetation disturbance would be minimized by replacement of topsoil in as near the original location as possible, scarification, mulching, and seeding / planting with species native to the immediate area. 2. Reclaimed/revegetated areas would be monitored after construction to determine if efforts are successful or if additional remedial actions are necessary. 3. Remedial actions could include installation of erosion-control structures, reseeding and/or replanting the area, and controlling non-native plant species. 4. In an effort to avoid introduction of non-native/noxious plant species, no imported topsoil or hay bales would be used during revegetation. Weed free materials (e.g., straw bales) may be used for erosion-control dams that may be necessary. 5. Non-native and/or invasive plant species would be controlled in areas determined to be high-priority by Preserve staff and other undesirable species would be monitored and controlled, as necessary. To prevent the introduction and minimize the spread of non-native vegetation and noxious weeds, the following measures would be implemented during construction: <ul style="list-style-type: none"> • Pre-construction surveys and spot treatments would be completed to assess and treat invasive species. • Pressure wash and/or steam clean all construction equipment to ensure that all equipment, machinery, rocks, gravel, or other material are cleaned and weed free before entering the Preserve. • Cover all haul trucks bringing asphalt or other materials from outside the Preserve to prevent seed transport. • Limit vehicle parking to existing roadways, parking lots, or access routes. • Limit disturbance to previously disturbed roadsides and culvert areas. No machinery or equipment should access areas outside the construction zone. Treatment of non-native vegetation would be completed in accordance with NPS-13, <i>Integrated Pest Management Guidelines</i>.

Federally Listed Species and Species of Special Consideration	<ol style="list-style-type: none"> 1. USFWS authorized biologists would provide oversight of all activities within the roadway corridor necessary to protect desert tortoise. 2. An individual would be designated the field contact representative to oversee project compliance and coordination. The field contact representative would be authorized to halt any activity that may harm desert tortoise. 3. Only the authorized biologist would be allowed to handle/relocate desert tortoise. 4. Presence/absence surveys would be conducted prior to construction. 5. Any desert tortoise relocated or otherwise removed from areas undergoing reconstruction would be handled in accordance with the procedures described in <i>Guidelines for Handling Desert Tortoise During Construction Projects</i> (Desert Tortoise Council 1994). 6. Temporary tortoise-proof fencing would be established around all designated staging areas. Tortoise fencing requirements can be found in the biological assessment (ISSi 2014). 7. Construction vehicles parked overnight on the side of the road in pre-existing turnouts would be checked for desert tortoise prior to moving the vehicle in the morning. 8. The contractor must prevent injury to the desert tortoise at sites with potential hazards (e.g., auger holes, steep-sided depressions) by installing exclusionary fencing around open pits or other hazardous sites. 9. A desert tortoise education program would be presented by the field contact representative to all construction personnel prior to any construction activities. At a minimum, the tortoise education program would cover the following topics: (1) desert tortoise distribution/occurrence, (2) general behavior and ecology, (3) sensitivity of the species to human activities, (4) legal protection, (5) penalties for violation of state or federal laws, (6) reporting requirements, and (7) project protective mitigation measures. 10. Field contact representative would maintain a complete record of desert tortoise encounters. 11. A litter control program would be implemented during construction to eliminate the accumulation of trash to avoid attracting ravens that may prey on juvenile desert tortoise. The Monitoring Program for desert tortoise would continue throughout the Preserve.
Water Resources	<ol style="list-style-type: none"> 1. Construction will not be performed during precipitation events that result in flow to stream channels affected by the project.
Wildlife or Wildlife Habitat	<ol style="list-style-type: none"> 1. Train workers to avoid or limit contact with migrating bird or mammal species. 2. Work outside of the existing road alignment and vegetation removal at Sites 1, 2, and 3 would be restricted from March 1 to June 15 for bird nesting.
Visitor Resources	<ol style="list-style-type: none"> 1. Motorists would be advised in announcements, programs, publications and temporary signs that there may be temporary inconveniences from construction work on the road. 2. In all cases, traffic control and safety shall be maintained. 3. The construction contractor shall include proposed daytime work protocols in its Quality Control Plan and its Safety Plan to show how traffic monitoring and controls would be implemented.
Archeological Resources and Cultural Landscapes	<ol style="list-style-type: none"> 1. Archeologically sensitive areas would be subject to monitoring by an archeologist approved by Mojave National Preserve. Should unknown archeological resources be uncovered, or should a cultural landscape feature be discovered, during construction, work would be halted in the discovery area, the site secured, and Preserve staff would be consulted according to 36 CFR 800.13 and 43 CFR 10. 2. In compliance with the Native American Graves Protection and Repatriation Act of 1990, work would be halted and NPS would also notify and consult concerned American Indian tribal representatives for the proper treatment of human remains, funerary, and sacred objects should these be discovered during the project. 3. Archeological specimens found within the construction area would be removed only by NPS archeologists who meet the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716), or their designated representatives.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The CEQ Regulations implementing NEPA and the NPS NEPA guidelines require that “the alternative or alternatives which were considered to be environmentally preferable” be identified (Council on Environmental Quality Regulations, Section 1505.2). The environmentally preferred alternative results in the least damage to the biological and physical environment; it is also the alternative that best protects, preserves, and enhances historic, cultural, and natural resources.

The Council on Environmental Quality defines the environmentally preferred alternative as “...the alternative that will promote the national environmental policy as expressed in the National Environmental Policy Act’s §101.” Section 101 of the National Environmental Policy Act states that “... it is the continuing responsibility of the Federal Government to ...

- 1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- 2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- 3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- 4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;
- 5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life’s amenities; and
- 6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.”

Alternative 1, the No Action Alternative, does not fully meet criteria 2 and 3 because it does not contribute to or provide for a safe visitor experience. As described in Chapter 4 of this EA, Alternative 2, the Proposed Action, including all mitigation measures outlined in this document, is the Environmentally Preferred Alternative because it best meets the evaluation criteria above. The Proposed Action protects public and employee health, safety, and welfare by addressing safety concerns associated with road alignments that do not meet federal highway safety standards, and confusing intersections that have poor sight lines and distance, while including mitigation measures that minimize impacts to desert tortoise, other wildlife, and natural habitat (criteria 2, 3, and 5); and limits damage to natural resources by providing an improved turnout at Granite Pass (criteria 1, 3, and 4) for visitor access, parking and viewing. The Proposed Action will significantly improve public health and safety by reducing the likelihood and severity of accidents within the Preserve, while simultaneously reducing impacts and risks to wildlife and the environment, and would also would improve Preserve operational efficiency and sustainability by reducing the need for ongoing road maintenance and the consumption of depletable resources associated with such maintenance (criteria 1 and 6).

SUMMARIES

The following sections summarize how well each alternative meets the project objectives, and the environmental impacts associated with each.

Table 2 summarizes how each of the alternatives does, and does not, meet project objectives. The summary is based on the environmental analyses described in Chapter 4.

Action alternatives selected for analysis must substantially meet all objectives to a large degree. Action alternatives must also address the stated purpose of taking action and resolve the need for action. Alternatives that did not meet the plan objectives were dismissed from further analysis.

Table 3 summarizes the impacts associated with each alternative by impact topic (or resource). The summary of impacts is based on the analyses presented in Chapter 4. Overall, adverse impacts to most resources are minor or negligible, and the Proposed Action would have beneficial impacts in several important areas, particularly related to visitor safety and experience.

Table 2: Summary Comparison of Impacts

Impact Topic	Alternative 1: No Action	Alternative 2– Proposed Action
Cultural Resources Archeological Resources Cultural Landscapes	Impacts to archeological sites under the No-action Alternative would be minor and adverse. The overall cumulative impacts to archeological resources from past, present, and reasonably foreseeable future projects in combination with the No-action Alternative would be minor and adverse. Impacts to the cultural landscape under the No-action Alternative would be negligible to minor and adverse.	Impacts to archeological sites under the Proposed Action would be minor and adverse. The overall cumulative impacts to archeological resources from past, present, and reasonably foreseeable future projects in combination with the Proposed Action would be minor and adverse. Impacts to the Kelso Depot Historic District cultural landscape under the Proposed Action would be moderate and adverse. The overall cumulative impacts to the cultural landscape from past, present, and reasonably foreseeable future projects in combination with the Proposed Action would be minor to moderate and adverse.
Federally Listed Species and Species of Special Consideration/Wild life	Under the No-action Alternative, existing conditions would result in short- and long-term, minor, adverse impacts to the desert tortoise and species of special concern. The overall cumulative impacts to the desert tortoise and species of special concern from past, present, and reasonably foreseeable future projects in combination with the No-action Alternative would be short and long-term, minor, adverse, and at a local scale.	The Proposed Action would result in short- and long-term, minor adverse impacts to the desert tortoise, species of special concern and wildlife, and short- and long-term beneficial. The overall cumulative impacts to the desert tortoise, species of special concern and wildlife concern from past, present, and reasonably foreseeable future projects in combination with the Proposed Action would be short and long-term, minor, adverse, and at a local scale.
Geological Resources – Soils	Under the No-action Alternative, existing conditions would result in short- and long-term, minor, localized adverse impacts to soils in the vicinity of the roadway. Cumulative impacts, including the No-action Alternative, would be short- and long-term, minor, adverse and at a local scale.	Under the Proposed Action, impacts to geologic landforms/soils would be detectable in the approximately 10 acres of newly disturbed area, would have measurable effects on soils, and result in soil erosion and compaction. These alterations would also result in the soils inability to sustain biota in the disturbed areas. Rehabilitation (revegetation and mulching) of approximately 1 acre of existing roadway, and mitigation measures for new disturbance would provide long-term and beneficial impacts to soils in the project area. The Proposed Action would result in impacts that would be localized within the project area, and would be short- and long-term, minor to moderate adverse, and short- and long-term, beneficial, and local. Cumulative impacts, including the Proposed Action, would be short- and long-term minor to moderate adverse at a

		local scale.
Water Resources	Under the No-action Alternative, existing conditions would result in short- and long-term, minor, localized adverse impacts to roads and washes along Black Canyon and Cedar Canyon Roads. Cumulative impacts, including the No-action Alternative, would be short- and long-term, minor, adverse and at a local scale.	Under the Proposed Action, impacts to water resources would be detectable along Black Canyon and Cedar Canyon roads. The Proposed Action would result in impacts that would be localized within the project area, and would be short- and long-term, minor adverse, and short- and long-term, beneficial, and at a local scale. Cumulative impacts, including the Proposed Action, would be short- and long-term minor adverse at a local scale.
Transportation	Under the No-action Alternative, existing conditions would result in short- and long-term, moderate, localized adverse impacts to roads and washes. Cumulative impacts, including the No-action Alternative, would be short- and long-term, moderate to major, adverse and at a local scale.	Under the Proposed Action, impacts to transportation would be detectable along all the roadways. The Proposed Action would result in impacts that would be localized within the project area, and would be short-term, minor to moderate adverse, and long-term, beneficial, and at a local scale. Cumulative impacts, including the Proposed Action, would be short-term minor to moderate adverse, and long-term beneficial at a local scale.
Vegetation	Under the No-action Alternative, existing conditions constitute short- and long-term, negligible, adverse impacts to vegetation in the vicinity of the roadways. The overall cumulative impacts from past, present, and reasonably foreseeable future impacts, in combination with the No-action Alternative, would be short- and long-term, negligible, and adverse.	Impacts to native vegetation would include crushing, trampling, transplanting, and removal within approximately 10 acres of new disturbed area. Rehabilitation (revegetation and mulching) of approximately one acre of existing roadway and mitigation measures in the areas of new disturbance would provide beneficial effects to native vegetation in the project area. Under the Proposed Action, impacts to native vegetation would be short- and long-term, minor to moderate adverse, and short- and long-term beneficial.
Visitor Experience/ Public Safety	Under the No-action Alternative, existing conditions would result in short- and long-term, minor to moderate, adverse impacts to visitor use/experience and visitor safety. The overall cumulative effects of these past, present, and reasonably foreseeable future actions on visitor use/experience and visitor safety, in conjunction with the No-action Alternative, would have short-term, minor to moderate, adverse impacts.	Under the Proposed Action, rehabilitation and reconstruction would result in short-term, moderate, and adverse impacts during the construction period. Once construction was completed, improvements would result in long-term, beneficial impacts to visitor use/experience and visitor safety. The cumulative effects in conjunction with the Proposed Action would result in short-term, moderate, adverse impacts and long-term beneficial effects to visitor use/experience and visitor safety.

CHAPTER 3: AFFECTED ENVIRONMENT

This chapter summarizes the conditions and characteristics of the natural and human environment that may be affected by the Proposed Action and alternatives under consideration. More comprehensive and detailed information on park resources and the environment may be found in the Mojave National Preserve Revised Draft Environmental Impact Statement and General Management Plan (GMP), July 2000, and in the Mojave National Preserve Foundation Document (June 2013).

The Foundation Document identifies ten fundamental resources and values (FRVs) associated with the environment that have been identified for the Preserve. The conservation of FRVs is considered essential to achieving the purpose of the Preserve and to maintaining its significance. They include:

- Full range of biological diversity of native species representative of the eastern Mojave Desert ecosystem, minimally disturbed by humans
- Exposed geologic features and landforms, including sand dunes, cinder cones, mesas, and dry lakes
- Desert scenery (encompassing geology, landscape, vegetation, big sky, wildlife, etc.)
- Living laboratory that provides unique opportunities for education and research of abundant cultural resources and a minimally disturbed desert ecosystem
- Natural soundscapes and dark night skies
- Vast expanse of undeveloped open space, including (but not limited to) wilderness
- Sense of discovery
- Exemplary relics, sites, stories, and other resources associated with ancient inhabitants and Mojave and Chemehuevi tribal cultures
- Exemplary relics, sites, stories, and other resources associated with historic uses of the eastern Mojave Desert (including mining, ranching, homesteading, and railroad history)
- Exemplary sites and stories associated with early trade, exploration, and transportation routes such as the Mojave Road and the Old Spanish National Historic Trail

CULTURAL RESOURCES

Archeological Resources

Numerous studies have examined archeological and cultural resources in the Preserve and the Mojave Desert region (GMP, 2002, and Nichols, 2004). The area is known to have been occupied into the historic period by the Southern Paiute (Chemehuevi) who practiced trade, hunting and gathering (Nichols, 2004). The Ancestral Mojave (Patayan) inhabited the area from 700-1700 AD before being displaced by the Southern Paiute. Many of the cultural traits of this Paiute group were adopted from the Mojave. The mid nineteenth century witnessed a displacement of most of the aboriginal communities by the US Army via Carleton's Campaign against the Paiute in 1860 (Casebier, 1974).

An archeological survey of each of the individual project sites was conducted by NPS (NPS, 2014). The survey covered 2.5 acres of proposed roadside realignments in mostly sandy creosote and Joshua tree forested areas. The survey was conducted across all of the proposed areas of potential impact. One small prehistoric site was discovered at Site 2 in the Kelso Pass area. This site had been previously impacted from road construction. The site is classed as a small lithic scatter (i.e., a surface scatter of cultural artifacts and debris that consists entirely of lithic (i.e.,

stone) tools and chipped stone debris), extending to both sides of the existing Kelbaker Road. Sparse debitage (material produced during the production of chipped stone tools) with one possible core of all local materials show this site to be an expedient procurement area with materials of marginal but somewhat useable quality. The site has been heavily impacted and dispersed by the original construction of Kelbaker Road and previous road construction including ongoing shoulder clearing. The most intact part of this scatter is on the southwest side of Kelbaker Road, and is at least 40 feet from the edge of the construction area.

Cultural Landscapes

A cultural landscape is a reflection of human adaptation and use of natural resources, often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. Natural features such as landforms, soils, and vegetation not only form part of the cultural landscape, but provide the framework within which it evolves. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, and vegetation, and by the use of cultural values and traditions. There are two cultural landscapes within the Preserve, including one within the area of this project, the Kelso Depot Historic District, adjacent to Site 4 (Kelbaker/Kelso-Cima Road Intersection).

The Kelso Depot Historic District and the surrounding town of Kelso are located in a relatively flat portion of an alluvial fan between the Kelso and Providence Mountains. The depot was built to provide a rest and fueling stop for steam locomotives preparing to ascend or finishing their descent of the Cima Grade. The period of significance began in 1923 with the construction of the current depot building and continued through the closure of the Vulcan Mine in 1947 to the cessation of depot functions in 1964. Throughout this period, the building and its surroundings functioned as a Union Pacific depot, as well as a transportation hub for Vulcan Mine ore extracted for the war effort between 1942 and 1947. The Depot created the sense of an oasis that would be welcoming to railroad passengers and employees who worked in the town. The shade of the elms, cottonwoods and palms, the lawns and other vegetation created a cool respite from the Mojave desert heat. Due to this welcoming setting and in part to the Kelso Lunch Room, the depot became an important local gathering spot for both passengers and residents. The depot grounds included approximately 2 acres in a rectangular plot of land at the intersection of Kelbaker and Kelso-Cima Roads. The exact location of the boundary is unclear. The area outside of the depot site retains only remnants of the original landscape elements. After the closure of the Depot in 1985, most of the vegetation at the site, including the elms, cottonwoods, shrubs, and lawn that created the image of the oasis in the desert died and was removed. Only five Canary Island date palms survived from the site's period of significance. Other important features, such as the loading platform brick surface, were also removed. This historic loading ramp (now referred to as the historic loading mounds) was built during WWII as part of the Vulcan mine which is south of the ramps and up in the Mountains. The ramps served as a way for trucks to drive up onto a high point over rail road cars where they could dump iron ore into the train cars that took the ore down to the Fontana CA area. The iron was used to build the Liberty supply ships during the war effort. After the bricks were removed, a metal fence was installed to prevent the public from approaching the railroad tracks. The historic landscape characteristics which retain integrity include natural systems and features, spatial organization, topography, circulation, buildings and structures, and views and vistas. During the restoration of the depot from 2002 through 2005, the landscape and vegetation were replanted in a manner consistent with the original design, as demonstrated in the historic photos.

The Soda Springs Historic District, also known as Zzyzx Mineral Springs, is located within the Preserve, but is not near any of the proposed project sites. This cultural landscape spanned historic periods from military operations in the 1850s; to salt and soda extraction industries in the early 1900s; to Curtis Howe Springer's Zzyzx Mineral Springs resort. Currently, CSU Fullerton operates the Desert Studies Center at Zzyzx under a Memorandum of Understanding.

FEDERALLY LISTED SPECIES AND SPECIES OF SPECIAL CONSIDERATION/WILDLIFE

Federally Listed Species

Under the Endangered Species Act (ESA) of 1973, as amended, an endangered species is defined as any species in danger of extinction throughout all or a significant portion of its range. Within the Preserve are confirmed populations or potentially viable habitat for three federally endangered, one federally threatened, six state (California) endangered and one state threatened plants and animals. The four federally listed species include the Mojave population of the desert tortoise (*Gopherus agassizii*), and the Mohave tui chub (*Gila bicolor mohavensis*). Final recovery plans exist for both of these species. The least Bell's vireo (*Vireo bellii pusillus*), and the Southwestern willow flycatcher (*Empidonax traillii extimus*), are listed birds that could inhabit riparian areas such as Piute Spring, but have not been verified to occur in the Preserve. As shown in Table 3, the federally listed species other than the desert tortoise are excluded from further analysis because they are not expected to occur near any of the project sites.

State Listed Species

California listed species known to occur in the Preserve include the desert tortoise, the Mohave tui chub, and the willow flycatcher (*Empidonax trailli*). In addition, the California (or western) yellow-billed cuckoo (*Coccyzus americanus occidentalis*, CA endangered), the elf owl (*Micrathene whitneyi*, CA endangered) and Swainson's hawk (*Buteo swainsoni*, CA Threatened) may have limited potential to appear in some areas of the Preserve, but their habitat requirements and distribution make it extremely unlikely that they would be found near any of the project sites. Table 3 summarizes the CA listed species known or suspected to occur within the Preserve, but not expected to occur at project sites, and the reason for their exclusion.

Table 3: Federally and State Listed Species Excluded from Further Analysis

Common Name	Scientific Name	Status	Habitat / Distribution	Reason for Exclusion
Mohave tui chub	<i>Gila bicolor mohavensis</i>	Endangered (Fed & CA)	Found at Soda Spring and pond at Morningstar Mine	No suitable habitat near project sites.
Least Bell's vireo	<i>Vireo bellii pusillus</i>	Endangered (Fed & CA)	Dense shrubs and small trees along rivers and streams	No suitable habitat near project sites.
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered (Fed & CA)	Requires dense riparian habitats with saturated soils, standing water, or nearby streams, pools, or cienegas.	No suitable habitat near project sites
Elf Owl	<i>Micrathene Whitneyi</i>	Endangered (CA)	Riparian habitats along the lower Colorado River	No suitable habitat within project area.
California (western) yellow-billed cuckoo	(<i>Coccyzus americanus occidentalis</i>),	Endangered (CA)	Normally requires broad riparian cover	No suitable habitat within project area
Swainson's Hawk	<i>Buteo Swainsoni</i>	Endangered (CA)	Breeds in Juniper – sage flats, riparian areas, and oak savannah. Requires trees	No suitable habitat within project area

Desert Tortoise

Of the listed species, the desert tortoise is known to occur within the areas that will be affected by this project. The range of the desert tortoise includes the Mojave and Sonoran deserts in southern California, Arizona, southern Nevada, the southwestern tip of Utah, and Sonora and northern Sinaloa, Mexico. Critical habitat for the Mojave population of the desert tortoise was designated in 1994 by the U.S. Fish and Wildlife Service (USFWS 1994). As shown on Figure 17, the Mojave population of the desert tortoise primarily occupies valleys and bajadas characterized by scattered shrubs, especially creosote, with intershrub space for growth of herbaceous plants. However, it may also occur in saltbush scrub, desert wash, desert scrub, and Joshua tree woodlands. The most favorable habitats occur at elevations of approximately 1,000 to 3,000 feet (USFWS 1994b), in soils that range from sand to sandy-gravel, though caliche soils, desert pavement, and rocky, boulder terrain are occasionally used (USFWS 1994). Desert tortoises spend a large portion of the year underground to avoid extreme temperatures and, for younger tortoises, to avoid predators such as coyotes, foxes, raptors, and ravens (Boarman, 2002). Tortoises generally are active during spring, early summer, and autumn when annual plants are most common and daily temperatures are tolerable. Additional activity occasionally occurs during warm weather in winter months and after summer rainstorms (Boarman, 2002).

Biological surveys of proposed project sites 1 through 5 identified active or recently used tortoise burrows at Sites 1 and 2 (NPS, 2014). In addition, Sites 3, 4 and 5 are within or very near critical habitat, although Sites 4 and 5 are highly disturbed and unlikely to provide useable habitat.

As early as the 1970s biologists recognized that desert tortoise numbers were declining sharply in many areas. In 1984, the USFWS listed the desert tortoise on the Beaver Dam Slope in Utah as a threatened species. The entire Mojave population was listed as a threatened species in 1990 (USFWS 1994). The population declines are mainly attributed to direct and indirect human-caused mortality coupled with the inadequacy of existing regulatory mechanisms to protect desert tortoises and their habitat. Desert tortoise habitat has been destroyed, degraded, and fragmented as a result of urbanization, agricultural development, livestock grazing, mining and roads. The removal of tortoises by humans for pets or use as food or folk medicine is also a major factor in the decline. A respiratory disease is an additional cause of desert tortoise mortality and population decline, particularly in the western Mojave Desert (USFWS 1994). Wildfire also is a threat to tortoise populations, due to the invasion of desert habitats by non-native plant species. Changes in plant communities caused by non-native plants and recurrent fire can negatively affect the desert tortoise by altering habitat structure and species available as food plants (Brooks 1995 and Avert 1998, as cited in USFWS 2008).

The Preserve has approximately 144 miles of paved and three miles of maintained dirt roads that traverse designated desert tortoise critical habitat (NPS, 2000). Approximately 147 miles of unmaintained roads in critical habitat were closed to motorized vehicles by the Congressional designation of wilderness. The most heavily used roads are Kelbaker from I-40 to Kelso (about 50% critical habitat), Kelso-Cima road (100% critical habitat) and Morningstar Mine road from Cima to the Nipton Road (100% critical habitat). Speeds on these roads often exceed 70 mph. The Union Pacific railroad corridor passes through the Preserve for about 91 miles, of which about 56 miles is through category I critical habitat. Interstate 15 crosses approximately 25 miles of category one critical habitat and Interstate 40 crosses about 39 miles along the northern and southern boundaries of the Preserve respectively.

In June 1994, the USFWS released the *Desert Tortoise (Mojave Population) Recovery Plan*, which presented recommendations for population recovery. This document also includes maps of critical habitat and of areas where recovery actions are recommended. These areas are called Desert Wildlife Management Areas. A revised draft recovery plan was released in 2008 (USFWS 2008).

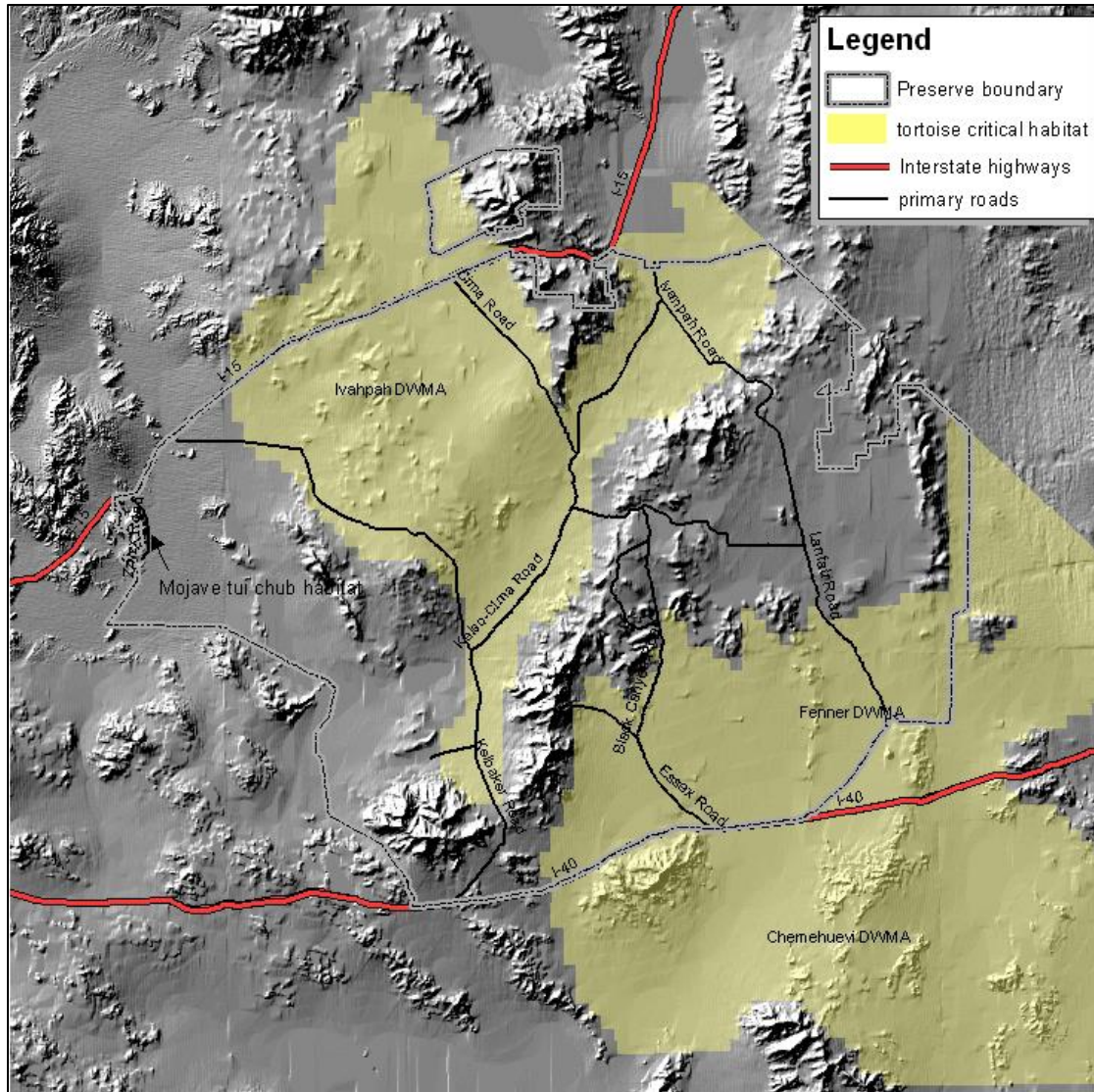


Figure 17: Map Showing Desert Tortoise Critical Habitat (from Mojave National Preserve Fire Management Plan, 2004)

The Desert Tortoise Recovery Plan shows that the Preserve's tortoise population densities are among the highest in the species range. The highest known densities occur in southern Ivanpah Valley, where about 20 square miles support densities of 200 to 250 per square mile. Throughout the rest of the Preserve, densities generally ranged from less than 50 to 100 per square mile.

The National Park Service is cooperating in an interagency effort to implement range-wide monitoring using protocols and methodologies adopted by the desert tortoise management oversight group. There are two areas of designated critical habitat in the Preserve. The northern

area includes Ivanpah Valley, south of Nipton Road, and areas north, west and south of Cima Dome, extending up to Interstate 15. This area totals approximately 492,360 acres (769 square miles) within the Eastern Mojave Recovery Unit. The second area of the Preserve with critical tortoise habitat is the Fenner/Clipper Valley, with 280,103 acres (438 square miles) of federal land, also within the Eastern Mojave Recovery Unit. Together, about 772,463 acres (48%) of the Preserve is designated as critical habitat for the desert tortoise (USFWS 1994).

Species of Special Consideration

NPS *Management Policies 2006* mandates that state and locally listed species will be managed in the same manner as federally listed species, where feasible. These include species, subspecies, or distinct populations native to California listed by the California Department of Fish and Wildlife (CDFW) as Species of Special Concern, and species considered sensitive by the NPS, BLM or other federal agencies (Sensitive Species). Over 30 Animal Species of Special Consideration (including migratory birds, mammals, reptiles, and insects) are known, or for which suitable habitat exists within the Preserve (Table 4, from NPS, 2000, Appendix D). The NPS completed vegetation surveys at all project sites in spring 2014. No special status species or signs of special status species were found.

Table 4: Animal Species of Special Consideration Potentially Present in Preserve

Animal Species		Listing Status	
Common Name	Scientific Name	Federal	State
BIRDS			
Cooper's hawk	<i>Accipiter cooperi</i>		CDFW SSC
golden eagle	<i>Aquila chrysaetos</i>	Protected	
long-eared owl	<i>Asio otus</i>		CDFW SSC
western burrowing owl	<i>Athene cunicularia-hypugea</i>		CDFW SSC
ferruginous hawk (P)	<i>Buteo regalis</i>	NPS SS	CDFW SSC
northern harrier	<i>Circus cyaneus</i>		CDFW SSC
yellow warbler (P)	<i>Dendroica petechia brewsteri</i>		CDFW SSC
prairie falcon	<i>Falco mexicanus</i>		CDFW SSC
yellow-breasted chat	<i>Icteria virens</i>		CDFW SSC
California grey-headed junco	<i>Junco hyemalis caniceps</i>		CDFW SSC
Loggerhead shrike	<i>Lanius ludovicianus</i>	NPS SS	CDFW SSC
hepatic tanager	<i>Piranga flava</i>		CDFW SSC
summer tanager	<i>Piranga rubra</i>		CDFW SSC
black-tailed gnatcatcher	<i>Poliioptila melanura</i>		CDFW SSC
vermillion flycatcher	<i>Pyrocephalus rubinus</i>		CDFW SSC
Bendire's thrasher	<i>Toxostoma bendirei</i>		CDFW SSC
Crissal thrasher	<i>Toxostoma crissale</i>		CDFW SSC
Le Conte's thrasher	<i>Toxostoma lecontei</i>		CDFW SSC
Virginia's warbler	<i>Vermivora virginiae</i>		CDFW SSC
gray vireo	<i>Vireo vicinior</i>		CDFW SSC
MAMMALS			
desert pallid bat	<i>Antrozous pallidus pallidus</i>		CDFW SSC
Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>	NPS SS	CDFW SSC
California leaf-nosed bat (P)	<i>Macrotus californicus</i>		CDFW SSC
Fringed myotis	<i>Muotis thysanodes</i>		
desert bighorn sheep	<i>Ovis canadensis nelsoni</i>	BLM SS	
Kingston Mountain chipmunk	<i>Tamias panamintinus acrus</i>		
american badger	<i>Taxidea taxus</i>		CDFW SSC

REPTILES			
banded gila monster	<i>Heloderma suspectum cinctum</i>	BLM SS	CDFW SSC
Rosy boa	<i>Lichanura trivirgata</i>	NPS SS	
chuckwalla	<i>Sauromalus obesus</i>		CDFW SSC
INSECTS			
Kelso Jerusalem cricket	<i>Ammopelmatus</i>		
Monarch butterfly	<i>Danaus plexippus</i>		
Kelso giant sand treader cricket	<i>Macrobaenetes kelsoensis</i>		

SS: Sensitive Species (Federal) SSC Species of Special Concern (CA)

Migratory Birds and Golden Eagles

The Migratory Bird Treaty Act (16 USC 703-712) protects migratory birds, and their nests, eggs, young, and parts from possession, sale, purchase, barter, transport, import, and export, and take. It applies to migratory birds that are identified in 50 CFR §10.13. Generally speaking, the Migratory Bird Treaty Act protects nearly all birds occurring in the United States. Many migratory birds, including raptor species, are sensitive to disturbance when nesting and roosting. Should disturbance result in the wounding or killing of adult birds, checks, or eggs, including abandonment of a nest with eggs or young, the activity causing the disturbance would violate the Migratory Bird Treaty Act. Under the authority of the Bald and Golden Eagle Protection Act (16 USC 668-668d), bald eagles and golden eagles are afforded additional legal protection.

Wildlife

The convergence of three desert environments has produced approximately 35 wildlife habitat types throughout the Preserve, supporting about 300 species of wildlife (GMP, 2002). The literature documents 36 species of reptiles, 206 species of birds and 47 species of mammals. Some of the more notable species include the gila monster, desert tortoise, Mohave tui chub, Mojave fringe-toed lizard, regal ring-necked snake, and desert striped whipsnake. Significant avian fauna include the prairie falcon, Bendire's thrasher, California thrasher, gray vireo, golden eagle, Lucy's warbler, mourning dove and Gambel's quail. The Preserve also supports numerous species of bats.

Bird species likely to occur near project sites include, but are not limited to, various hawks, vultures, falcons, quail, doves, owls, hummingbirds, woodpeckers, flycatchers, ravens, wrens, and sparrows. Biological surveys of the proposed project sites identified numerous species of birds (Darby, 2014). White-crowned and black-throated sparrows were noted at Site 1. At Site 2, a male house finch was seen singing from a Joshua tree. A black-throated sparrow and a black-tailed gnatcatcher were seen, as well as a turkey vulture. At Site 3, a loggerhead shrike perched on a yucca, along with a female Phainopepla, a cactus wren, a Gambel's quail in her nest, a flock of white-crowned Sparrows, and a black-throated Sparrow. One found nest contained 15 eggs. None of the birds detected are considered sensitive or migratory (Darby, 2014).

The Kelbaker/Cima Junction bird survey detected rock doves, Eurasian collared doves, common ravens, house sparrows and house finches. At the Cima/Morning Star Junction, white-crowned sparrows and common ravens were detected.

Large mammals known to occur in or near the project sites include desert bighorn sheep (*Ovis canadensis nelsoni*), mule deer, and mountain lion. Coyote, bobcats, fox, badgers, skunks, cottontail and jackrabbits also occur. In addition, the Preserve supports a significant population of wild burros, although none are present at any of the project sites.

A wide variety of small mammals also inhabit the Preserve, including numerous species of mice, rats, squirrels, chipmunks, and gophers. Reptile species include numerous species of lizards and snakes.

Desert Bighorn Sheep: Nelson's bighorn sheep (*Ovis canadensis nelsoni*) is one of three subspecies of bighorn sheep in California, occurring in desert mountain ranges from the White Mountains to the San Bernardino Mountains, and southeastward to Mexico. Bighorn sheep prefer open areas of low-growing vegetation for feeding, with close proximity to steep, rugged terrain for escape, lambing, and bedding, and adequate source of water, and travel routes linking these areas. Native populations are found in most of the mountainous terrain of the Preserve, with population estimates as of 1994 at between 400 and 675 or more animals in several herds (Torres, S. G. et al. 1994). The population is not listed by the U.S. Fish and Wildlife Service, but is now listed as sensitive by the California Department of Fish and Wildlife (CDFW 2005), and is also considered sensitive by BLM due to the fragmentation of habitat throughout its range. In the past year, respiratory disease has also threatened the population. Studies are ongoing to determine the impact to the herds. Mojave National Preserve is also one of the few places in California where bighorn sheep hunting has been allowed. Limited hunting of bighorn sheep began in 1987 (BLM 1988). A limited number of permits to hunt bighorn sheep are issued each year by CDF&G through a lottery system.

GEOLOGICAL RESOURCES AND SOILS

The Preserve is a land of mountain ranges, sand dunes, creosote flats, great mesas, extinct volcanoes, Joshua tree forests, and other desert landforms, ranging in elevation from 800 feet above sea level near Baker to nearly 8,000 feet in the Clark Mountains. Ancient metamorphic rocks that date back 2.5 billion years have been identified in the Clark Mountains. Other areas of the Preserve are dominated by Paleozoic limestone containing caves such as Mitchell Caverns, Mesozoic granitic intrusive rocks at Cima Dome and in the Granite Mountains, and a variety of volcanic rocks near Hole in the Wall and Black Canyon. Geologically very young volcanic rocks occur in the Cinder Cones National Natural Landmark, with cinder cones and basalt flows that erupted as recently as 10,000 years ago. The Mojave Desert and the Preserve are part of the physiographic region known as the basin and range province, characterized topographically by mountain ranges that rise steeply and abruptly from the desert floor, interspersed with broad gently sloping valleys. The mountains generally trend southwest to northeast. Many of the valleys and desert flatlands are basins that are not drained by rivers, and are largely mantled by unconsolidated or poorly consolidated Quaternary surface deposits, sometimes covered by desert pavement or crust deposits, and cut by ephemeral streams and washes that frequently wash out the unpaved roads during flash flood events.

The prevailing winds of the Mojave Desert are from the west. Wind-blown sand is picked up west of the Preserve in the Mojave River area and from playas and dry lake beds, and carried eastward and deposited in the area around Kelso Dunes, and in a few well-developed dune systems near the town of Kelso.

A wide array of soil types are found in the Preserve. Soils with sandy textures with gravel and rock cobbles are most common at the project sites, along with fine to medium grained sands and gravel in stream washes. Soils with medium textures; and with calcium carbonate (e.g., caliche) accumulations are common, as is the development of desert pavement and/or biologically formed desert crust. Fine silt to sand textured soils are found in playa prone areas: the playas also

commonly contain salt minerals precipitated when ephemeral lakes and ponds evaporate. In some areas, especially at higher elevations, soils with a developed horizon reflecting an older age and formation during different (wetter) moisture regimes are found. Shallow soils and upland soils are also present. The Preserve also contains escarpments, ephemeral streams, and the extensive areas of sand dunes and young volcanic rocks described above. The lava flows and cinder cones are so young that very little soil formation has occurred.

Detailed soil surveys have not been completed for the Preserve: websites for both the U.S. Department of Agriculture Natural Resource Conservation Service Web Soil Survey (WSS), and the State of California Soil Resource Lab (SoilWeb) show the Preserve as unmapped.

For the most part, the topography at the proposed project sites is relatively flat, except for the proposed realignments on Kelbaker Road at Kelso Pass and Granite Pass which are at the summit of mountain passes. The upland topography between washes is commonly relatively flat, with sparse vegetation and varying degrees of desert pavement on the surface.

WATER RESOURCES

Currently, high volume surface water flows periodically inundate Cedar Canyon and Black Canyon Roads and deposit sand and gravel on the road surface, which requires post-event removal by Preserve maintenance crews. Flood events may also add new sediments and nutrients to the washes, redistribute and mix them with existing deposits, producing a sand and gravel texture with little organic material. Portions of Cedar Canyon and Black Canyon Roads will be re-constructed within washes or floodplains.

Analysis of the proposed project sites by FHWA indicated that approximately 0.2 acres of non-wetlands “waters of the U.S.” occur at Sites 1, 2, 3, and 4 on Kelbaker Road where the road crosses ephemeral stream channels, and at the Low Water Crossings on Cedar Canyon Road (Site 6). During storms, significant surface water flow can occur in these drainages.

Groundwater is found underneath most of the Preserve and varies greatly in depth and quality. Groundwater basins in the Preserve are recharged from surface and subsurface infiltration. Groundwater is the principal source for desert springs, seeps, and a few ephemeral streams. The maintenance of groundwater quality and quantity is critical to the survival of desert surface waters and their associated plant and animal life.

The small springs and seeps in the Preserve offer isolated and limited water for plants, wildlife, or domestic or commercial purposes. Some springs produce potable water, but overall water quality is poor because of high dissolved mineral concentrations (BLM 1996). Over 200 springs and seeps have been identified in the Preserve (King and Casebier 1981). Many have been altered by the installation of retention dams, pipelines, and troughs for livestock use. A perennial stream called Piute Creek flows for about one mile in the eastern portion of the Preserve.

The number of known springs and seeps is greater than early inventories, most likely because of the addition of wells and guzzlers installed for agriculture and livestock. Water wells have been drilled primarily for domestic use and livestock needs, but a number of wells have also been drilled for mining use.

Geographically, most of the water resources of the project area occur within the area regulated by the Lahontan Regional Water Quality Control Board (RWQCB), although a portion in the Southeast is within the jurisdiction of the Colorado River RWQCB. Water quality standards and control measures for surface and ground waters of the Lahontan Region are stated in the Water

Quality Control Plan for the Lahontan Region (basin plan). The basin plan designates beneficial uses for water bodies and establishes water quality objectives, waste discharge prohibitions, and other implementation measures to protect those beneficial uses.

TRANSPORTATION

The road network in the Preserve is important to visitors and staff responsible for operating and maintaining facilities, and is also used by members of the public passing through. The proposed project would improve road conditions and access to campgrounds, visitor centers, and other areas of interest within the Preserve. At some of the proposed project sites (e.g., Site 3), visitors currently pull off the road or stop in areas that were not designed or constructed for parking, which may impede traffic. As vehicles move from the gravel shoulder back onto the paved roadway, gravel is pulled onto the road creating a hazard for vehicles, especially motorcycles. Sight distances are poor at several intersections, and at sharp curves and elevation changes. There are minimal turnouts or parking areas along the roadway to allow slower-moving traffic to turnout or for visitors to stop and view the scenery. Drainage control issues result in periodic flooding and maintenance issues. Many visitors tend to drive too fast for conditions.

The roads in the Preserve are also used by private property owners and residents to access their land and structures throughout the year, particularly in the eastern and southern portions of the Preserve, including areas traversed by Black Canyon and Cedar Canyon Roads. Roads provide a lifeline for medical, fire and emergency services for local residents who live in the Preserve, and/or visit on weekends.

In 1993, the year before the Preserve was designated, visitation was estimated at 250,000. In 2011, the Preserve had 536,000 visitors (Road System Evaluation, Mojave National Preserve, 2013). Some sections of road most frequently used by Preserve visitors have geometric deficiencies that contribute to vehicular accidents and fatalities. From 2001 to 2012, there were 134 accidents on Kelbaker Road, four of which were fatalities (accident data from the Department of Public Works, San Bernardino County, 2012 and CH2M Hill Traffic Study; 2012). During the same timeframe, there were 50 accidents on Morning Star Mine Road, with three fatalities. There were 62 accidents on Kelso/Cima Road, and eight on Black Canyon Road during the same 11 year period.

VEGETATION

There are no known federally listed or proposed plant species in the Preserve. Thorne's buckwheat (*Eriogonum ericifolium* var. *thornei*) is listed by the state of California as an endangered species. It is known from two occurrences in the New York Mountains, where it is found at elevations of approximately 5,500 feet in pinyon and juniper woodland and prefers copper-rich gravel (Hickman, 1993). The Revised Draft EIS/GMP (NPS, 2000) lists over 40 Plant Species of Special Consideration that have been identified within the Preserve, but surveys of the proposed project sites during spring 2014 have not identified any rare, threatened or endangered plants at those locations.

The vegetation resources of the Preserve are the result of the convergence of three major North American Deserts: the Great Basin, Mojave, and Sonoran deserts. The vegetative communities within the Preserve are mainly derived from the Mojave Desert, but also include species of the Great Basin and Sonoran Deserts, and even some attributes of the California Coastal Zone. The Preserve is a unique floristic area, with many species distributed only within its boundaries. In

contrast, some areas such as the New York Mountains contain species of manzanita, California lilac, and oak and silk tassel, which are normally associated with coastal California. The Mid Hills have significant stands of Great Basin sagebrush and Utah juniper. There is a strong association with the Sonoran Desert, whose northernmost range intermingles with the southern border of the Preserve. Sonoran plant species such as teddy bear cholla and smoke tree are found extending several miles into the southeast portion of the Preserve.

Vegetation community types present within the Preserve include playas, saltbush, creosote-covered flats and alluvial fans, and Joshua tree woodlands. There are also many unique and/or rare habitats within the Preserve: examples include the Joshua tree, Mojave yucca, and Spanish bayonet communities on Cima Dome. The quality and extent of the Joshua tree forest on Cima Dome is unparalleled anywhere in the world. There are seven different types of wash plant species associations including: cat's claw acacia, smoke trees, and desert willows. Higher elevations support grassland, sagebrush, blackbrush, pinyon-juniper woodlands as well as unique remnant habitats containing small white fir forests, and pinyon-junipers with oak in the higher elevations. The Piute Creek desert oasis also supports a fragile and limited riparian community.

A total of 803 species of plants representing 85 plant families have been identified in the Preserve, and more than 100 discrete ecological environments, defined as Vegetation Alliances by Thomas, et al, 2004, have been defined and mapped in the Mojave Desert, based on plant communities, geology/soils conditions, moisture, elevation and other factors (). The Vegetation Alliances are grouped into seven categories, including Forest, Woodland, Shrubland, Dwarf-Shrubland, Herbaceous Vegetation, and Sparse Vegetation.

The project sites range in elevation from about 2,000 feet to over 5,000 feet above sea level and are characterized by a variety of vegetation communities. Sites 1 and 4 (Kelbaker Road and Kelso Depot) are at approximately 2000 feet, Site 2 (Kelso Pass) is at approximately 3700 feet, Site 3 (Granite Pass) is at approximately 4000 feet, Site 5 (Cima) is at approximately 4200 feet, Site 6 (Cedar Canyon Road) is at approximately 4900 feet, and Sites 7 and 8 (Black Canyon Road) are at approximately 5300 feet.

The creosote shrub community is the most widespread throughout the Preserve. Below 3,000 feet (e.g., at Sites 1 and 4), the vegetation is generally dominated by *Larrea tridentata* (creosote bush), *Prosopis* spp. (mesquite), *Yucca* spp. (yucca), *Fouquieria splendens* (ocotillo), and several species of cactus. When moisture conditions are favorable (e.g. in Kelso Wash at Site 4), *Acacia greggi* (cat's claw), *Parkinsonia* spp. (palo verde), and *Chilopsis* spp. (desert willow) may also appear, as well as several species of grass, and cactus. At higher elevations (e.g., Kelso Pass at Site 2, Cima at Site 5), *Yucca brevifolia* (Joshua Tree) and *Yucca schidigera* (Mojave Yucca) are common. At Granite Pass (Site 3), a variety of cactus species are abundant. The highest elevation sites along Cedar Canyon and Black Canyon Roads (Sites 6, 7, and 8) are characterized by a diverse mix of scrubland vegetation types and cacti.

The intersections at Sites 4 and 5 (Kelso and Cima) are highly disturbed, and have significant non-native vegetation, including introduced (e.g., palm trees and cottonwoods) and invasive species.

Non-native Vegetation: There are 60 known nonnative plant species that have been identified in the Preserve. Tamarisk or salt cedar (*Tamarix ramosissima*), Russian thistle, and introduced annual grasses (from Europe and Asia) such as *Bromus* and *Schismus* species are some of the more pernicious exotics within the Preserve. These species often outcompete native vegetation,

especially along roadways, subsequently eliminating or displacing natives and associated native animals. Annual plants such as introduced grasses and Russian thistle may cause an unnatural increase in the amount of dried material available as wildfire fuel.

VISITOR EXPERIENCE/PUBLIC SAFETY

Mojave National Preserve provides recreational opportunities for people from all over the world. Its proximity to major population centers such as Los Angeles and Las Vegas, combined with major interstate highways, gives residents the opportunity for relatively easy access to many parts of the desert. Most of the landscape is open, with broad vistas of undeveloped land. The vast landscape offers visitors an opportunity for seclusion and a sense of wildness, even while in a vehicle. Early miners and ranchers developed roads that today offer visitors a chance to drive into many remote locations where informal camping has traditionally occurred. The sand dune systems are a recreational attraction. Hikers play on and explore the Kelso Dunes. There are many cultural sites such as Kelso Depot, Soda Springs, the Mojave Road and numerous abandoned mining districts. Mountain ranges, such as the New York and Providence Mountains, offer a contrast to the dry hot valleys, attracting many people in summer with cooler temperatures and forested areas. Caverns, caves, volcanic cinder cones, lava flows, rock outcrops, and unique wildlife, wildflowers and vegetation are other elements that attract visitors. Most visitors come to the desert simply to see the scenery of this diverse landscape.

Because of high summertime temperatures, most visitation to the Preserve occurs during spring and fall. A 1997 visitor survey (NPS, 2000) indicated that 64% of the visitors were from California and 11% were from Nevada. Most people started from Las Vegas, Nevada or from Twentynine Palms or Barstow, California on the day of their visit. There are also numerous visitors driving a scenic route between Joshua Tree National Park and Death Valley. The most concentrated use periods are during the upland bird and deer hunting seasons in October and November, and the Thanksgiving and Easter weekends. Many residents of adjacent communities such as Needles, Laughlin and Bullhead City visit the higher elevations in the Preserve during the summer to escape the heat and enjoy a change of scenery.

Most visitation occurs on weekends when residents of California, Arizona and Nevada arrive. Daytime recreational use is expected to continue to increase as the populations of Clark County and Laughlin, Nevada, Bullhead City and Kingman, Arizona, Barstow and Needles, California continue to grow. Most use in the Preserve is sightseeing and driving for recreation, but the landscape offers many other forms of recreation including nature study, rock-climbing, mountain climbing, motorized 4x4 touring, hiking, hunting and trapping. However, traffic counters and field observations also indicate that many people use the roads in the Preserve as a route between Las Vegas and Twentynine Palms. This route shortens the drive from approximately four hours (260 miles) to three hours (190 miles), and does not require motorists to travel west on I-40 to access I-15 north.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

NEPA requires the disclosure of environmental effects of proposed federal actions, and any adverse environmental effects that cannot be avoided should the Proposed Action be implemented. Analysis of impacts follows CEQ guidelines and DO-12 procedures (NPS 2011) and is based on the underlying goal of providing unique scenic and other natural values and provisions for use and enjoyment of the outdoor recreation resources at the Preserve.

The Environmental Consequences chapter discloses both beneficial and adverse impacts that would result from implementing any part of the project. This analysis incorporates the best available literature applicable to the setting and the actions being considered in the alternatives. For each resource topic addressed in this chapter, the applicable analysis methods are discussed, including assumptions and impact intensity definitions. In addition, this chapter includes a summary of laws and policies relevant to each impact topic, definitions of impact “thresholds” (negligible, minor, moderate, major), explanations of methods used to analyze impacts, and the analysis methods used for determining cumulative effects.

GENERAL METHODS FOR ANALYZING IMPACTS

This section analyzes the potential environmental consequences that would occur as a result of implementing **Alternative 1: No Action** or **Alternative 2: Proposed Action**. Potential impacts are described in terms of type, context, duration, and intensity. General definitions are defined as below, whereas more specific impact thresholds are given for each resource at the beginning of each resource section.

This section also includes the framework for the impact analysis, including key assumptions, parameters or measures of impact, and analytical techniques or approaches. Overall, NPS based these impact analyses and conclusions on the review of existing literature and Preserve studies, information provided by experts within the Preserve and other agencies, professional judgments, Preserve staff insights, consultation with the state historic preservation office and interested local Tribes, and public input.

For each impact topic, impacts are defined in terms of thresholds of effect, context, intensity, duration, and timing. This EA does not define thresholds for beneficial impacts. Impacts and cumulative effects are discussed in each impact topic. Definitions of intensity levels vary by impact topic. Where it is not specifically stated otherwise under each impact topic, the following definitions apply.

Type: Whether the impact would be beneficial or adverse. Beneficial impacts would improve resource conditions; adverse impacts would deplete or negatively alter resources.

Intensity: Impact intensity is the degree to which a resource would be beneficially or adversely affected. Criteria were used to rate the intensity of the impact. Intensity of the effect is described as negligible, minor, moderate, or major.

Duration: Duration of impact is analyzed independently for each resource. Depending on the resource, impacts may last for the construction period, a single year, or other time period. For purposes of this analysis, impact duration is described as short- or long-term as defined for each resource. *Short-term* impacts are temporary, transitional, or construction-related impacts

associated with project activities. *Long-term* impacts are typically those effects that would last several years or more or would be permanent.

Context: Context is the setting within which an impact would occur such as local, Preserve wide, regional, global, or any combination of these. *Local impacts* would generally occur within the immediate vicinity of the proposed project. *Regional impacts* would occur on surrounding lands and/or in adjacent communities. Context is variable and depends on the circumstances involved with each impact topic. The CEQ requires that impact analyses include discussions of context.

Impact: Both direct and indirect impacts are analyzed, consistent with CEQ regulations (40 CFR 1502.16) and DO-12. The following definitions of direct and indirect impacts are used but not specifically identified in the environmental analysis:

Direct Impact: effects are caused by an action and occur at the same time and place as the action.

Indirect Impacts: effects are caused by the action and occur later or farther away, but are still reasonably foreseeable.

Cumulative Impacts: The CEQ regulations, which implement NEPA, require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions” (40 CFR 1508.7). Cumulative impacts are considered for both **Alternative 1: No Action** and **Alternative 2: Proposed Action**.

PROJECTS THAT MAKE UP THE CUMULATIVE IMPACT SCENARIO

Cumulative impacts were determined by combining the impacts of either **Alternative 1: No Action** and **Alternative 2: Proposed Action** with other past, present, and reasonably foreseeable future actions. Table 5 summarizes the actions that were identified for the purpose of conducting the cumulative effects analysis.

Table 5: Actions Analyzed in the Cumulative Impact Scenario

Action	Description	Resources Potentially Affected
Past Projects		
Kelso Depot Restoration	Kelso Depot, part of the historic Kelso District, was renovated to improve the Visitor Center	Cultural Landscape
Research and collecting permits	Can be multi-year; used for scientific research	Vegetation, Wildlife
2004 Fire Management Plan	Fire suppression; wild land fire use; mechanical fuel management at appropriate locations	Vegetation, Wildlife, Visitor Safety, Cultural Landscape
Construction of trails	Barber Peak Loop Trail and rerouting; Hole in the Wall trail; Rock Horse-Rock Spring trail;	Visitor Experience, Vegetation
Safety Installations on Abandoned Mines	Safety measures include: foot chain-link fences around the pit with a gate on the access road to the bottom at the Vulcan mine and using various closing techniques (grates, fencing, mesh nets, etc.) at other locations	Visitor Safety, Cultural Landscape, Wildlife

Conversion of Ranching Wells to Wildlife Guzzlers	Retrofitted 12 ranching water developments into wildlife guzzlers	Wildlife, Water Resources
Present Projects		
Water Resources Management Plan	Comprehensive, ecosystem scale management plan for water throughout the Preserve.	Water Resources, Wildlife, Vegetation
SUP permit to install remote monitoring units for Calnev Pipeline	Calnev wants to install eight temporary remote monitoring units (RMUs) along its 8" and 14" petroleum pipelines in Soda Dry Lake, Mojave National Preserve.	Wildlife
On-going Fire Management activities	Fire suppression; wild land fire use; mechanical fuel management	Vegetation, Wildlife, Visitor Safety, Cultural Landscape
Future Projects		
Special Park Uses, Commercial Uses, and Scientific Research and Collecting activities	Permits for events and scientific research	Visitor Safety, Visitor Experience, Vegetation, Wildlife, Transportation Safety
Fire Management activities	Fire suppression; wild land fire use; mechanical fuel management	Vegetation, Wildlife, Visitor Safety, Cultural Landscape
Pavement Preservation Project	Repave all paved roads in the Preserve. Treatments include: crack sealing, pothole filing, application of chip or slurry seal coat	Visitor Experience, Wildlife, Vegetation
BLM Stateline Solar and Silver State Solar South Projects	300-megawatt Stateline Solar Farm Project, a facility that will be built in San Bernardino County, California, on approximately 1,685 acres of public land located two miles south of the California-Nevada border. 250-megawatt Silver State South Solar Project located near Primm, Nevada on approximately 2,400 acres of public land.	Wildlife
Immediate Response Inspections by Southern CA Gas	For example, in 2013, Line 235 required immediate response inspection. Two dig locations were identified.	Wildlife, Vegetation,

CULTURAL RESOURCES

Section 106 of the *National Historic Preservation Act of 1966* requires federal agencies to consider the effects of their undertakings on properties listed or potentially eligible for listing on the National Register of Historic Places. All actions affecting the Preserve's cultural resources must comply with this legislation.

Archeological Resources Protection Act of 1979. This act (PL 96-95, 93 Stat. 712, 16 USC Section 470aa et seq. and 43 CFR 7, subparts A and B, 36 CFR) secures the protection of archeological resources on public or Indian lands and fosters increased cooperation and exchange of information between private, government, and the professional community in order to facilitate the enforcement and education of present and future generations. It regulates excavation and collection on public and Indian lands. It requires notification of Indian tribes who may consider a site of religious or cultural importance prior to issuing a permit.

Archeological Resources

Impact Intensities: Impacts to archeological resources were determined based on the following impact definitions and thresholds.

Negligible Impacts. Impacts are at the lowest levels of detection. There are no perceptible consequences to an archeological site's potential to yield important information. For purposes of Section 106, the determination of effect would be a no adverse effect.

Minor Impacts. Impacts to an archeological site(s) are identifiable and measurable, but would result in little loss of important information. For purposes of Section 106, the determination of effect would be a no adverse effect.

Moderate Impacts. Impacts to an archeological(s) are apparent and measurable but do not result in a loss of most or all of the site(s) and its potential to yield important information. For purposes of Section 106, the determination of effect would be an adverse effect.

Major Impacts. Impacts to an archeological site(s) are substantial and result in the loss of most or all of the site and its potential to yield important information. For purposes of Section 106, the determination of effect would be an adverse effect.

Long-term Impact. Because most archeological resources are non-renewable, any effects would be long-term.

Alternative 1: No Action Alternative. Selection of the No Action alternative would represent a continuation of current conditions. As no action would be taken in this alternative, roadway construction would not occur. The archeological site at Site 2 would not be affected, nor would any other unknown archeological resource in the project area. Therefore there would be no adverse perceptible consequences to archeological resources and impacts to archeological sites would be negligible.

Cumulative Impacts. Archeological resources are subject to damage from a variety of natural events and human activities. Projects with the potential to affect archeological resources include fire management activities, past roadway improvement projects and ongoing road maintenance activities. These activities include rehabilitation and reconstruction of roadways, shoulder grading, shoulder edge repair, and recreational development (such as kiosks, trailheads, and waysides). Roadway maintenance and recreational development activities would continue and could increase due to continued deterioration of the roadway and increased visitor use. Future activities would also likely include rehabilitation and reconstruction of other roadways within the Preserve.

Ground disturbance associated with this construction activity would generally occur in previously disturbed areas but has the potential to impact unknown archeological resources. Since the project area has been surveyed for the presence of other resources the overall cumulative impacts to archeological resources from past, present, and reasonable foreseeable future projects in combination with the No Action alternative would be negligible and adverse.

Conclusion. The overall cumulative impacts to archeological from past, present, and reasonably foreseeable future projects in combination with the No Action alternative would be negligible and adverse.

Alternative 2: Proposed Action. Under the Proposed Action at Site 2: Kelbaker Road, Kelso Pass roadway alignment would be implemented near an archeological lithic scatter site. This is the only project site with known archeological resources. Construction monitoring and fencing off the site would ensure avoidance of impacts to the archeological site. The most intact portions is located approximately 50 feet from the construction activities, would ensure avoidance of impacts to the archeological site. Disturbance would be localized within the construction site

area. Impacts to an archeological site would be identifiable and measurable, but would result in little loss of important information potential. Impacts to the archeological site under the Proposed Action would be minor and adverse.

Cumulative Impacts. For analysis of cumulative impacts to archeological resources, past, present, and reasonably foreseeable future projects within or adjacent to the Preserve are similar as those outlined above for the No Action alternative. Archeological resources would continue to be subject to damage from a variety of natural events and human activities. Development, park maintenance, vandalism, theft, and natural processes all pose a threat to these resources. Roadway maintenance and recreational development activities would continue and could increase due to continued deterioration of roadways and increased visitor use. Future activities would also likely include rehabilitation and reconstruction of other roadways within the park. Reconstruction, rehabilitation, development, and maintenance actions have the potential to affect archeological sites. Ground disturbance associated with the Proposed Action construction activities would generally occur in previously disturbed areas; however, new disturbance would occur on approximately 3.35 acres at Site 2 (Kelso Pass). However, the new disturbance would be away from the archeological site. Potential impacts would be mitigated through monitoring, best management practices, project design, and consultation as applicable. The overall cumulative impacts to archeological resources from past, present, and reasonably foreseeable future projects in combination with the Proposed Action would be minor and adverse.

Conclusion. Impacts to archeological sites under the Proposed Action would be minor and adverse. The overall cumulative impacts to archeological resources from past, present, and reasonably foreseeable future projects in combination with the Proposed Action would be minor and adverse.

Cultural Landscapes

Impact Intensities: Impacts to cultural landscapes were determined based on the following impact definitions and thresholds.

Negligible Impacts. Impacts are at the lowest levels of detection. There are no perceptible consequences to an historic site. For purposes of Section 106, the determination of effect would be a no adverse effect.

Minor Impacts. Alteration of patterns or features of the landscape would not diminish the overall integrity of the landscape. Impacts to an historic site(s) are identifiable and measurable, but would result in little loss of important information potential. The National Register status of the site(s) would be unaffected. For purposes of Section 106, the determination of effect would be a no adverse effect.

Moderate Impacts. Alteration of patterns or features of the landscape would diminish the overall integrity of the landscape. Impacts to an historic site(s) are apparent and measurable but do not result in a loss of most or all of the site(s) and its potential to yield important information. The site would remain eligible to be listed in the National Register. For purposes of Section 106, the determination of effect would be an adverse effect.

Major Impacts. Alteration of patterns or features of the landscape would severely diminish the overall integrity of the landscape. Impacts to a cultural landscape(s) are substantial and result in the loss of most or all of the site and its potential to yield important information. The site(s)

would no longer be eligible to be listed in the National Register. For purposes of Section 106, the determination of effect would be an adverse effect.

Long-term Impact. Because most resources related to cultural landscapes are non-renewable, any effects would be long-term.

Alternative 1: No Action Alternative. Selection of the No Action alternative would represent a continuation of current conditions. As no action would be taken in this alternative, intersection modification adjacent to Kelso Depot (Site 4) would not occur. The Kelso Depot Historic District cultural landscape which includes the intersection could continue to be impacted by visitor activities as Kelso Depot (registered as a National Historic Landmark in 2000) which serves as a Visitor Center. Minor maintenance and construction activities along the roads and at the Kelso Visitor Center would continue to occur. Impacts to the cultural landscape under the No Action alternative would be negligible.

Cumulative Impacts: Cultural landscapes are subject to damage from a variety of natural events and human activities. Development, Preserve maintenance, vandalism, traditional visitor use, and natural processes all pose a threat to Kelso Depot Historic District. Past, present, and reasonably foreseeable future projects with the potential to affect the Kelso Depot include fire management activities, past roadway improvement projects, and ongoing road maintenance activities. In addition the Kelso Depot underwent a major revocation which included parking lot improvement, installation of bathroom facilities, picnic area, and reconditioning of the Depot building into a Visitor Center. Other activities include rehabilitation of roadways, shoulder grading, shoulder edge repair, and recreational activity and development such as planned modifications or changes to the Kelso Depot visitor center. Roadway maintenance activities would continue and could increase due to increased visitor use. Reconstruction, rehabilitation, development, and maintenance actions have the potential to affect the cultural landscape. The No Action alternative impacts detailed above would add an adverse increment to overall cumulative impacts. The overall cumulative impacts to the cultural landscape from past, present, and reasonably foreseeable future projects in combination with the No Action alternative would be minor and adverse.

Alternative 2: Proposed Action. Under the Proposed Action, realigning and modifying the intersection between Kelbaker Road and Kelso-Cima Road (Site 4) would affect the historic road alignment which is a contributing landscape feature. These actions would alter the contributing landscape feature of the Kelso Depot, Restaurant, and Employees Hotel. The proposed changes would widen the road from 20 feet, which was noted in the National Register nomination form, to 26 feet. Impacts to the setting and viewshed of the Kelso Depot Historic Depot cultural landscape under the Proposed Action would be moderate and adverse, and would result in an adverse effect for Section 106 of the NHPA. The NPS will mitigate this adverse effect through a Memorandum of Agreement with the CA SHPO. Moving Kelso-Cima Road 50 feet northwest would change the historic configuration of the road but it would also create a more defined T intersection than is described in the NRHP Registration Form. All construction staging would be temporarily on disturbed areas across from Kelso Depot area: this would result in only short-term impacts. The visitors' parking lot adjacent to the Depot is currently graveled and would be paved with asphalt, but since the lot is not a contributing feature of the historic district, no impacts to cultural resources are anticipated. Other changes associated with the Proposed Action, including additional signs and a proposed speed table, are minor modifications to the cultural landscape and would not significantly impact the viewshed. The historic loading ramp/mound is

approximately 1/4 mile south of the depot, on the west side of Kelbaker Rd and would not be impacted by this project.

Overall, disturbance would be localized within the project area. Under the Proposed Action, the Kelso Depot would not be impacted. Impacts to the setting and viewshed of the Kelso Depot Historic Depot cultural landscape under the Proposed Action would be moderate and adverse.

Cumulative Impacts. For analysis of cumulative impacts to cultural landscapes, past, present, and reasonably foreseeable future projects within or adjacent to the Preserve are the same as those outlined above for the No Action alternative. The Kelso Depot Historic District would continue to be subject to damage from a variety of natural events and human activities. Development, Preserve maintenance, vandalism, theft, traditional visitor use, and natural processes all pose a threat to Kelso Depot Historic District. Roadway maintenance and recreational development activities would continue and could increase due to continued deterioration of roadways and increased visitor use.

Reconstruction, rehabilitation, development, and maintenance actions have the potential to affect the Kelso Depot Historic District cultural landscape. Ground disturbance associated with the Proposed Action construction activities would occur in previously disturbed areas. Impacts would be mitigated through best management practices, project design, and consultation as applicable.

Conclusion. Impacts to the Kelso Depot Historic District cultural landscape under the Proposed Action would be moderate and adverse and would result in an adverse effect in accordance with Section 106 on the NHPA. Overall, disturbance would be localized within the project area. Impacts to the setting and viewshed of the Kelso Depot Historic Depot cultural landscape under the Proposed Action would be moderate and adverse.

The overall cumulative impacts to the cultural landscape from past, present, and reasonably foreseeable future projects in combination with the Proposed Action would be minor to moderate and adverse.

FEDERALLY LISTED SPECIES AND SPECIES OF SPECIAL CONSIDERATION/WILDLIFE

Impacts to federally listed threatened and endangered species and their critical habitat, species of special concern, and wildlife were determined based on the following impact definitions and thresholds.

Negligible Impacts. There would be absolutely no effects to the species or its critical habitat, either positive or negative. In the case of federally listed species, this impact intensity would equate to a USFWS determination of “no effect.”

Minor Impacts. The action would result in a change to a population or individuals of species or its critical habitat. The change could be measurable, but small and localized and not outside the range of natural variability. Mitigation measures, if needed, would be simple and successful. In the case of federally listed species, this impact intensity would equate to a USFWS determination of “may affect, not likely to adversely affect.”

- "No effect" means there will be no impacts, positive or negative, to listed or proposed resources. Generally, this means no listed resources will be exposed to action and its environmental consequences. Concurrence from the Service is not required.

- "May affect, but not likely to adversely affect" means that all effects are beneficial, insignificant, or discountable. Beneficial effects have contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact and include those effects that are undetectable, not measurable, or cannot be evaluated. Discountable effects are those extremely unlikely to occur. These determinations require written concurrence from the Service.
- "May affect, and is likely to adversely affect" means that listed resources are likely to be exposed to the action or its environmental consequences and will respond in a negative manner to the exposure.

Moderate Impacts. Impacts on species, their habitats, or the natural processes sustaining them would be detectable and occur over a large area. Breeding animals of concern would be present, and animals would be present during vulnerable life stages. Mortality or interference with activities necessary for survival would be expected on an occasional basis but would not be expected to threaten the continued existence of the species in the Preserve. Mitigation measures would be extensive and likely successful. In the case of federally listed species, this impact intensity would equate to a USFWS determination of "may affect, likely to adversely affect."

Major Impacts. The action would result in noticeable effects to the viability of the population or individuals of a species. Impacts on species or the natural processes sustaining them would be detectable, both inside and outside of the Preserve. Loss of habitat might affect the viability of at least some special status species. Extensive mitigation measures would be needed to offset any adverse effects, and their success could not be guaranteed. In the case of federally listed species, the impact intensity would equate to a USFWS determination of "may affect, likely to jeopardize the continued existence of a species or likely to adversely modify designated critical habitat."

Short-term Impact. Recovers in less than one year or within one breeding season.

Long-term Impact. Recovers in more than one year or within more than one breeding season.

Alternative 1: No Action Alternative. Under the No Action alternative, there would be no impacts to desert tortoise habitat, tortoises, migratory birds or other wildlife as a result of construction.

There would continue to be the potential for vehicles traveling along the roadways to impact federally threatened desert tortoise, designated desert tortoise critical habitat, and other wildlife species of special concern crossing the road, resulting in injury or death. In addition, desert tortoise and other wildlife species of special concern would be vulnerable to attack by predators during any road crossings, a major problem for juvenile tortoises escaping ravens that have adapted to foraging along roads. Plant species of special concern and tortoise critical habitat may be impacted if vehicles leave the roadway in non-designated areas, resulting in damage or death of these plants. Under the No Action alternative there would likely continue to be disturbance or mortality of individual desert tortoise due to the road effect. Due to the road effect zone, the populations of tortoises adjacent to the roadway are depressed out to 400 meters and stabilize at 800 meters (Boarman and Sazaki 2006). Other studies suggest the zone of depression can extend as far as 1,600 meters (Nicholson 1978) 3.2 kilometers (Karl 1989) or 4.6 kilometers (von Seckendorff and Marlow 2002). This would likely continue to be small and localized. Under the No Action alternative, existing conditions would result in short- and long-term, minor, adverse impacts to the desert tortoise and species of special concern.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect the desert tortoise and species of special consideration include past roadway improvement projects, ongoing road maintenance activities, research and collection permits, utility improvements, game hunting, and fire management. These activities include rehabilitation and reconstruction of roadways, pothole repair, chip sealing, shoulder grading, shoulder edge repair, and recreational development (such as kiosks, trailheads, visitor centers, and waysides). These roadway maintenance and recreational development activities would continue and may increase due to continued deterioration of the roadway and visitor use.

A Biological Opinion (BO) for the General Management Plan was issued by the U.S. Fish and Wildlife Service in 2001 that covered a multitude of actions including roadway maintenance. This BO was written when San Bernardino County maintained the majority of the roadways in the Preserve and may need to be revisited now that the NPS is maintaining all the roadways in the Preserve.

Future activities would also likely include rehabilitation and reconstruction of other roadways within the Preserve. Reconstruction, rehabilitation, development, and maintenance actions have the potential to affect the desert tortoise and species of special concern by disturbance and mortality of individual species. Past, present, and reasonably foreseeable future projects within the Preserve and the surrounding region would contribute to habitat loss affecting the abundance and diversity of some of these species by changing the capacity of habitat to provide necessary food, shelter, and reproduction sites.

Conclusion. The cumulative impacts to the desert tortoise and its designated critical habitat and species of special concern could result in detectable changes to these species, but such changes would be small and localized. Under the No Action alternative, existing conditions would result in short- and long-term, minor, adverse impacts to the desert tortoise and species of special concern. The overall cumulative impacts to the desert tortoise and species of special concern from past, present, and reasonably foreseeable future projects in combination with the No Action alternative would be short and long-term, minor, adverse, and at a local scale. There would be no effect to migratory birds or other wildlife.

Alternative 2: Proposed Action. Due to construction, total new soil disturbance would be approximately 10.65 acres, 6.85 acres of which are designated critical habitat. Approximately 1.3 acres of existing roadway would be reclaimed and vegetated.

Federally Listed Species. The federally listed desert tortoise is known to occur within the project area. Implementation of the Proposed Action may affect the desert tortoise and designated critical habitat. Construction activities would likely result in impacts to the desert tortoise. Direct effects include the loss of available forage and burrowing locations. The Proposed Action would result in the loss of approximately 10.65 acres of habitat across five sites: 1.7 acres of creosote scrub (critical habitat), 3.4 acres of Creosote scrub/ Joshua tree/Yucca scrub (critical habitat), 3.8 acres of Chollas/Yucca Mesquite scrub, and 1.8 acres of Chrysothamnus/Greasewood scrub (critical habitat). The loss of habitat is immediately adjacent to existing roads. Approximately 1.3 acres would be revegetated in areas where the existing road would be demolished. Since the area is heavily disturbed, there would be no long-term tortoise habitat features that would be affected.

Other impacts include: potential harm during clearing, grading, and trenching activities; potential disruption of tortoise behavior during construction activities; disturbance by noise or vibrations

from heavy equipment; incidental destruction of habitat in a buffer area around the project footprint; damage to soil and cryptogams on the periphery; incidental death of unseen tortoise along roads, beneath crushed vegetation, or in undetected burrows; destruction of burrows; handling of tortoise; entrapment of tortoises in pits or trenches; attraction of ravens and facilitation of their survival by augmenting food or water; fugitive dust; and toxins from exhaust (Hughson and Darby, 2013, Boarman and Sazaki, 2006; Boarman 2002). The removal of 6.85 acres of designated critical habitat would reduce available forage for active tortoises.

Desert tortoise may be attracted to the construction area by the application of water to control dust, placing them at higher risk of injury or mortality. Tortoises may also seek shade by taking shelter under parked vehicles and be killed, injured, or harassed when the vehicle is moved. Impacts may also occur to desert tortoise from transportation and access within the project area. This species is mobile and is likely to occur along the project roadways and may be killed or wounded by vehicles, including construction vehicles. Construction-related impacts would primarily result in short-term, minor, and adverse impacts. The current road effect zone along each of the Proposed Action sites will not change after the project is completed. The current roadway locations have been continually used for over 30 years and impacts related to the roadways would continue to be present regardless of the proposed rehabilitation and reconstruction actions.

Indirect effects are those effects that are caused by or would result from the Proposed Action and are later in time, but still reasonably certain to occur. Road effects at all sites are ongoing and trending toward higher volume as the population increases and the Preserve becomes better known. Although speed limits through the Preserve are 45 to 55 mph along major roads, some people tend to exceed these speeds across the vast open spaces and the improved flatness and curvature of the improved Kelbaker Road could result in increased speed through Sites 1, 2 and 3. To mitigate this potential effect, the Preserve will continue road mortality monitoring, and the desert tortoise Recovery Implementation Team (RIT) is pursuing law enforcement actions to control speed throughout the Preserve.

Road corridors are vectors for invasive plant species, which have the potential to invade and change native plant communities. Once invasive plants become established on site, they have the potential to displace native food sources for the vegetarian desert tortoise, increase fire potential, and change the overall structure of a plant community. Having the contractor clean all equipment following the conservation measures would ensure that no propagules are transported onto the site from outside areas. The disturbance of soils with invasive plant seed could result in the spread of the invasive into areas disturbed during construction. Site 1 has a Sahara mustard (*Brassica tournefortii*) population close enough to pose a problem when reestablishing native vegetation.

Revegetation of disturbed areas with native seeds, transplanting native plant species, and mulching will result in the rehabilitation of critical habitat and beneficial effects to the tortoise. Implementation of the avoidance and mitigation measures outlined for the Proposed Action would minimize potential impacts to the desert tortoise and critical habitat. Impacts could be detectable, but would occur over a localized area. Construction activities could occur during the desert tortoise breeding season, and tortoise would likely be present during vulnerable life stages. Mortality or interference with tortoise activities could occur, but would not be expected to threaten the continued existence of the tortoise in the Preserve.

The burrows near Sites 1 and 2 are outside of the project footprint. If tortoises were to be in these burrows during construction, they could be subject to noise or vibration disturbance. At Site 1, one burrow is 50 feet from the edge of construction; this proximity suggests that a tortoise could wander into the construction zone causing work to slow down or stop due to the potential to harm a tortoise. However, since this entire area has been extensively disturbed from past maintenance activities, and does not represent high quality habitat, the likelihood of encountering a tortoise in this disturbed area is expected to be low. The authorized biologist would monitor these burrows for any emergence and direct work accordingly.

A biological assessment has been developed for submittal to the USFWS and formal Section 7 consultation for this species is currently underway (NPS 2014). The conservation measures and mitigation measures listed under the Proposed Action would reduce adverse impacts during construction to the handling of tortoises encountered during construction.

Migratory Birds: Implementation of the Proposed Action may result in disturbance to migratory bird species during construction activities. Mitigation measures have been incorporated into the Proposed Action that would minimize disturbance and avoid take of migratory bird species. Work outside of the existing road alignment and vegetation removal at Sites 1, 2, and 3 would be restricted from March 1 to June 15 for nesting.

The removal of 10.65 acres of roadside habitat would likely have a minor impact. The narrow linear impacts along each side of actions would have a minimal effect to breeding habitat for migratory birds. Revegetation and rehabilitation of the approximately 1.3 acres of disturbed areas would result in beneficial effects to migratory bird species. Under the Proposed Action, impacts to migratory bird species would be short-term, minor, adverse, and short- and long-term, minor, beneficial.

State Listed Species and Species of Special Consideration. Impacts to bird, reptiles, and mammal species of special concern would likely be similar to those discussed above for the desert tortoise. Mitigation measures proposed for the desert tortoise would also benefit other wildlife species at the project site to some degree. Daily monitoring by the authorized biologist would also detect the presence of, and protect, any burrowing owls onsite.

Approximately 10.65 acres of previously undisturbed areas along the roadways would be cleared. Disturbed areas would be revegetated with native seeds, transplanting native plant species, and mulching. This would result in reduced invasive species and improved native plant habitat.

Impacts to species of concern could be detectable, but would occur over a localized area. Construction activities could occur during the breeding season for species of special concern and these species would likely be present during vulnerable life stages. Mortality or interference with activities could occur, but would not be expected to threaten the continued existence of species of special concern in the Preserve.

Wildlife

Small Mammals. During construction, there would be disturbance to habitat for small animals such as reptiles and small burrowing mammals. This impact would be temporary during construction activities.

Large Mammals. Desert Bighorn sheep (*Ovis Canadensis nelsoni*) are known to migrate between mountain ranges within the Preserve. Two Proposed Action roadway locations, Kelbaker Road

Site 3(Granite Pass) and Kelbaker Road – Kelso Pass Site 2, are within the natural migration pathway of Desert Bighorn sheep. Construction activities including noise may inhibit these mammals from crossing during the daytime. Other large mammal groups such as Mule Deer (*Odocoileus hemionus* subsp. *Californica*), Bobcat (*Lynx rufus*), Cougar (*Puma concolor*), Coyote (*Canis latrans*), Fox (*Vulpes macrotis arsipus*), as well as introduced large mammals such as the wild burro may be affected by construction noise. Beneficial impacts will include the installation of Wildlife Crossing signage, and improved sight lines and sight distances would benefit these animal populations by reducing the likelihood of accidental collisions with animals crossing the roadway.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect the desert tortoise, species of special concern and wildlife include past roadway improvement projects and ongoing road maintenance activities. These activities have been analyzed during consultation with USFWS for the General Management Plan (BO 1-8-00-F-36) and include rehabilitation and reconstruction of roadways, pothole repair, chip sealing, shoulder grading, shoulder edge repair, and recreational development (such as kiosks, trailheads, visitor centers, and waysides). These roadway maintenance and recreational development activities would continue and may increase due to continued deterioration of the roadway and visitor use. Future activities would also likely include rehabilitation and reconstruction of other roadways within the Preserve. Reconstruction, rehabilitation, development, and maintenance actions have the potential to affect the desert tortoise and species of special concern by disturbance and mortality of individual species. Past, present, and reasonably foreseeable future projects within the Preserve and the surrounding region would contribute to habitat loss affecting the abundance and diversity of some of these species by changing the capacity of habitat to provide necessary food, shelter, and reproduction sites.

Desert tortoise may be impacted by handling and deliberate manipulation by curious members of the public traveling along the roadways once construction is complete. Tortoise could be illegally removed from the wild or translocated to new sites.

Effects to the tortoise related to the roadways following construction will be similar to the current road effect zone and may include degradation of habitat because the roadways serve as a potential corridor of dispersal for non-native invasive plants, predators, recreation, and other anthropogenic sources of impacts. The most common non-native invasive plants found in tortoise habitat are cheatgrass, red brome, split grass or Mediterranean grass, redstem filaree, Russian thistle, and Sahara mustard (Boarman 2002). In general, non-native invasive plants tend to proliferate in disturbed areas; however, rainfall and soil nutrient levels also play a key role. In areas where non-native invasive plants out-compete native species, tortoise may forage on the invasive plants which may be of lower-quality nutrient value (Boarman 2002). Roads also fragment habitats and populations. Roadways attract ravens, which are reportedly significant predators of desert tortoise (primarily juveniles). The current roadway locations have been continually used for over 30 years and impacts related to the roadways would continue to be present regardless of the proposed rehabilitation and reconstruction actions.

The cumulative impacts to the desert tortoise, species of special concern and wildlife could result in detectable changes to these species, but such changes would be relatively small and localized. Rehabilitation efforts under some past, present, and future actions, including rehabilitation of 1.3 acres of disturbed areas and mitigation measures under the Proposed Action, would result in beneficial effects to desert tortoise and species of special concern. The overall cumulative

impacts to the desert tortoise, species of special concern and wildlife from past, present, and reasonably foreseeable future projects in combination with the Proposed Action would be short- and long-term, minor, adverse, and long-term, beneficial effects at a local scale.

Conclusion. Under the Proposed Action, existing conditions would result in short- and long-term, minor, adverse impacts to the desert tortoise, species of special concern and wildlife. Under the Proposed Action, impacts to the desert tortoise and critical habitat would be short- and long-term, minor, adverse, and short- and long-term, beneficial. Under the Proposed Action, impacts to migratory bird species would be short-term, minor, adverse, and short- and long-term, beneficial. Impacts to the Desert Bighorn sheep will be short-term and minor adverse.

The overall cumulative impacts to the desert tortoise, species of special concern and wildlife concern from past, present, and reasonably foreseeable future projects in combination with the Proposed Action would be short and long-term, minor, adverse, and at a local scale.

GEOLOGICAL RESOURCES/SOILS

Analyses of the potential intensity of impacts to geologic resources and soils were derived from the available geology/soils information and published reports. The Preserve encompasses a wide variety of classic desert landforms including mesas, bajadas, dry lakes, sand dunes, and cinder cones. These features have been designated significant by NPS (Foundation Document, 2013). The thresholds of change for the intensity of impacts to geological resources/soils are defined below.

Negligible Impacts. Impacts that are at the lowest levels of detection and cause very little or no physical disturbance/removal, compaction, or unnatural erosion when compared with current conditions are negligible impacts. Alteration to geology and/or soils would be so slight that it would not affect the soils ability to sustain biota, water quality, and hydrology. Geology and soils would be consistent with historical or baseline conditions.

Minor Impacts. Impacts that are slight but detectable in some areas, with few perceptible effects of physical disturbance / removal, compaction, or unnatural erosion of soils are minor impacts. Alteration to geology and/or soils would affect its ability to sustain biota, water quality, and hydrology. Slight alterations in geology and soils would be consistent with historical or baseline conditions. Mitigation measures, if needed to offset adverse impacts, would be simple and successful.

Moderate Impacts. Impacts that are readily apparent in some areas and have measurable effects of physical disturbance/removal, compaction, or unnatural erosion of soils are moderate impacts. Alteration to geology and/or soils would affect its ability to sustain biota, water quality, and hydrology. Alterations to geology and soils may occur. Mitigation measures, if needed to offset adverse impacts, could be extensive but would likely be successful.

Major Impacts. Impacts that are readily apparent in several areas and have severe effects of physical disturbance/removal, compaction, or unnatural erosion of soils are major impacts. Alteration to geology and/or soils would have a lasting impact on its ability to sustain biota, water quality, and hydrology. Extensive mitigation measures would be needed to offset any adverse impacts and their success could not be guaranteed.

Short-term Impact. Short-term impacts recover in less than three years.

Long-term Impact. Long-term impacts take three or more years to recover.

Alternative 1: No Action Alternative. There would be no impacts to geologic landforms and surface soils as a result of construction. Geologic landforms and surface soils would continue to be susceptible to erosion from wind, water, animals, and humans. Impacts to soils may occur when people, cattle or animals cross the roadways, vehicles inadvertently leave the roadway (i.e., not within designated areas), potentially causing disturbance and compaction of soils along the roadway edge. Grading completed as part of periodic Preserve maintenance of the roadways would disturb soils adjacent to roadway shoulders. These impacts may be slightly detectable in some areas and result in soil erosion, compaction, and breakup of soil crusts. These alterations may also result in the soils inability to sustain biota in the disturbed areas. The soils impacts would be localized along the roadways and would be consistent with historical or baseline conditions.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect soil resources include past roadway improvement projects and ongoing road maintenance activities. These activities include rehabilitation and reconstruction of roadways, pothole repair, chip sealing, shoulder grading, shoulder edge repair, and recreational development (such as kiosks, trailheads, visitor centers, and waysides). These roadway maintenance and recreational development activities would continue and may increase due to continued deterioration of the roadway and visitor use. Future activities would also likely include rehabilitation and reconstruction of other roadways within the Preserve. Reconstruction, rehabilitation, development, and maintenance actions have the potential to affect soil resources by disturbance, compaction, and increased erosion of soils. These impacts may also result in the inability of disturbed soils to sustain biota.

Conclusion. Under the No Action alternative, existing conditions would result in short- and long-term, minor, localized adverse impacts to soils in the vicinity of the roadway. Cumulative impacts, including the No Action alternative, would be short- and long-term, minor, adverse and at a local scale.

Alternative 2: Proposed Action. Roadway rehabilitation would occur mostly within the existing roadway bench or existing disturbed areas. Paving of an established graveled parking area by Kelso Depot and establishing a day hike parking area off of Granite Pass would also occur. Staging for construction activities would occur within previously disturbed areas. One boulder would be removed at the Granite Pass site. Total new soil disturbance would be approximately 10.65 acres. However upon construction completion the majority of the 10.65 acres would be under pavement so no erosion would occur. During construction, these impacts would be readily detectable in the disturbed areas, would have measurable effects on physical disturbance and removal of soils, resulting in soil erosion and compaction. These alterations would also result in the inability of the soils to sustain biota in the disturbed areas. Revegetation activities will help reestablish desert soil horizons in the affected locations. Although surface soils would continue to be susceptible to erosion from wind and water, establishing a designated day use parking area at Granite Pass would reduce soil erosion and thus provide long-term and beneficial impacts. Rehabilitation (revegetation and mulching) of approximately 1.3 acres along the roadway would also provide long-term and beneficial impacts to soils in the project area. In addition, mitigation measures for soil impacts under the Proposed Action would reduce impacts and protect Preserve resources.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect soil resources include past roadway improvement projects and ongoing road

maintenance activities which include rehabilitation and reconstruction of roadways, pothole repair, chip sealing, shoulder grading, and shoulder edge repair. These roadway maintenance activities would continue and may increase due to continued deterioration of the roadway. Future activities would also likely include rehabilitation and reconstruction of other roadways within the Preserve. Reconstruction, rehabilitation, and maintenance actions have the potential to affect soil resources by disturbance, compaction, and increasing erosion of soils. These impacts may also result in the inability of disturbed soils to sustain biota. Ground disturbance associated with construction activities such as roadway reconstruction, and recreational development within the Preserve would have localized effects, but the soil character over a large area would not change. Rehabilitation efforts conducted under some past, present, and future actions, including rehabilitation of 1.3 acres of disturbed areas and mitigation measures under the Proposed Action would result in beneficial effects to soil resources. The overall cumulative impacts to soils from past, present, and reasonably foreseeable future projects in combination with the Proposed Action would be short- and long-term, moderate adverse, and at a local scale.

Conclusion. Under the Proposed Action, impacts to geologic landforms/soils would be readily detectable in the approximately 10.65 acres of newly disturbed area, would have measurable effects on physical disturbance and removal of soils, and result in soil erosion and compaction. These alterations would also result in the soils inability to sustain biota in the disturbed areas. Rehabilitation (revegetation and mulching) of approximately 1.3 acres along the roadway as well as mitigation measures incorporated into the Proposed Action would provide long-term and beneficial impacts to soils in the project area. The Proposed Action would result in impacts that would be localized within the project area, and would be short- and long-term, minor to moderate adverse depending on site location, and short- and long-term, beneficial, and at a local scale. Cumulative impacts, including the Proposed Action, would be short- and long-term minor to moderate adverse at a local scale. Implementation of this alternative is consistent with §1.4.7.1 of NPS Management Policies 2006.

WATER RESOURCES

Water resources refer to the supply of groundwater and surface water in the Preserve. Water resources may also reference the current or potential value of the resource to the community and the environment including water quality. The project area contains no wetlands or perennial streams; however the low water crossings on Cedar Canyon Road (Site 6), and the Black Canyon Road slope protection project (Site 8) are located in ephemeral stream washes where flash floods occur during the winter. These washes are considered constituted non-wetland waters of the U.S. (FHWA 2014). As non-wetland waters of the US a NW permit from the U.S. Army Corps of Engineers may be required. In addition, a 404 permit from the Regional Water Quality Control Board may also be required.

The NPS is required to analyze actions that would affect the functioning of a floodplain or increasing flooding (NPS DO 77-2, 2007). The Proposed Action will not increase flooding or significantly affect the functioning of the floodplains along Cedar Canyon and Black Canyon Roads: it will limit stream channel erosion and damage to the roadways, and reduce the need for emergency repairs and maintenance. According to the Handbook for NPS DO 77-2, the Proposed Action is exempt from an NPS Statement of Findings because the project sites and floodplains on Cedar Canyon and Black Canyon Roads are “isolated backcountry sites, natural or undeveloped sites along trails or roads, survey and study sites, or other similar activities.”

Impacts to water resources are categorized as follows.

Negligible Impact: Changes would be either undetectable or barely detectable; any effects would be slight.

Minor Impact: Changes in surface water or groundwater would be measurable, although the changes would be small and may affect a few organisms. The changes could include increased or decreased loads of sediment, debris, chemical or toxic substances, or pathogenic organisms.

Moderate Impact: Changes in surface water or groundwater would be clearly measurable and potentially affect organisms or natural ecological processes.

Major Impact: Changes in surface water or groundwater would be readily measurable, result in substantial changes, and potentially affect organisms or natural ecological processes. These changes would be noticed on a Preserve wide or regional scale.

Short-term Impact: Short-term impacts recover in less than one year.

Long-term Impact: Long-term impacts take one or more years to recover.

Alternative 1: No Action Alternative. Selection of the No Action alternative would represent a continuation of current conditions. As no action would be taken in this alternative, the roadways and washes along Black Canyon and Cedar Canyon Roads would not be rehabilitated or reconstructed. Preserve maintenance of the roadways would include grading, filling potholes, restoring access after storm damage by rehabilitating the stream crossings or rebuilding stretches of Black Canyon Road, etc. These impacts are ongoing and would be negligible. Major storm events in some areas would continue to cause roads to be closed for periods of time denying access to residents and visitors.

Conclusion. Under the No Action alternative, existing conditions would result in short- and long-term, minor, localized adverse impacts to roads and washes along Black Canyon and Cedar Canyon Roads. Cumulative impacts, including the No Action alternative, would be short- and long-term, minor, adverse and at a local scale.

Alternative 2: Proposed Action. Under the Proposed Action, proposed roadway improvements at Black Canyon and Cedar Canyon include improving roadway grades, curvature, embankment protection, adding low water crossings, and slope armoring. Slope armoring will affect the hydrology by stabilizing the banks causing less gravel, sand, and soil to wash downstream. Low water crossings will be constructed using asphalt or recycled asphalt. The low water crossings will not impede or affect the flow of water, but will reduce erosion and damage to stream banks during flooding events. Asphalt leaching studies indicate that pollutants generated through Toxicity Characteristic Leaching Procedure are below detection limits (Towsend, T.G., 1998, *Leaching Characteristics of Asphalt Road Waste*, p.77). Therefore, no impacts to water quality are anticipated. Beneficial long-term impacts include a lessening in stream bed erosion due to slope armoring. The Proposed Action would have no impact on groundwater infiltration or in stream flow. Mitigation measures under the Proposed Action would reduce impacts and protect Preserve resources.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect Preserve water resources include past roadway and wash improvement projects and ongoing road maintenance activities which include rehabilitation and reconstruction of roadways, pothole repair, restoring access after storm damage, shoulder/bank grading, and

shoulder/bank edge repair. Future activities would also likely include rehabilitation and reconstruction of other roadways and washes within the Preserve. Storm events exceeding the design storm (50 year event) have the potential to wash cement and rock downstream resulting in the deposition of foreign material into the bedload or leaving this material along embankments. Reconstruction, rehabilitation, and maintenance actions have the potential to affect Preserve water resources.

Conclusion. Under the Proposed Action, impacts to water resources would be detectable along Black Canyon and Cedar Canyon roads; the reasons for this conclusion are described above. The Proposed Action would result in impacts that would be localized within the project area, and would be short- and long-term, minor adverse, and short- and long-term, beneficial, and at a local scale. Cumulative impacts, including the Proposed Action, would be short- and long-term minor adverse at a local scale.

TRANSPORTATION

Vehicular safety refers to the safe movement and travel speed of vehicles through the project area including traffic circulation. A safe road network ensures that vehicles have adequate sight distances at corners, intersections, and parking areas; minimizes the possibility for conflicts among motorized vehicles, pedestrians, and bicyclists; and that allows for vehicles to easily stay within their travel lanes. Each alternative was evaluated on the basis of its expected impact on vehicular safety according to the following impact thresholds:

Negligible Impact: Changes would be either undetectable or barely detectable; any effects would be slight.

Minor Impact: Changes would be measurable, although the changes would be small; slight changes to vehicular safety conditions at selected locations would be detectable to the visitor population.

Moderate Impact: Changes would be clearly measurable and changes to vehicular safety conditions would be clearly detectable and could have an appreciable effect.

Major Impact: Changes would be readily measurable, result in substantial changes, and changes to vehicular safety conditions would be clearly detectable and would dramatically change the possibility for roadway accidents.

Short-term Impact: Short-term impacts recover in less than one year.

Long-term Impact: Long-term impacts take one or more years to recover

Alternative 1: No Action Alternative. Preserve maintenance of the roadways would include rehabilitation and reconstruction of roadways, pothole repair, chip sealing, shoulder grading, shoulder edge repair, restoring access after storm damage, and recreational development (such as kiosks, trailheads, visitor centers, and waysides). Traffic circulation patterns would remain the same. No parking areas will be affected. Vehicle accidents may increase due to continued road deterioration. Signage would remain the same.

Conclusion. Under the No Action alternative, existing conditions would result in short- and long-term, moderate, localized adverse impacts to roads and washes. Cumulative impacts, including the No Action alternative, would be short- and long-term, moderate to major, adverse and at a local scale.

Alternative 2: Proposed Action. Preserve management has indicated that road management is a high priority critical need (MOJA Foundation Document, 2013). Under the Proposed Action, proposed changes to the roadways include changes that would increase traffic safety by improving roadway elevations, grades, curvatures, sight distances, and realignment of two intersections. In addition roadway access will be improved on two unpaved roads that frequently washout during storm events. Traffic circulation will be impacted. During construction at Sites 1 and 2, Kelbaker Road would be closed from Kelso to I-15, having a measureable effect on traffic circulation in this area of the Preserve, requiring visitors and staff to use other routes. Parking area next to the Kelso Depot Visitor Center would be paved improving visitor safety and dust reduction.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect Preserve transportation include past roadway and wash improvement projects and ongoing road maintenance activities which include rehabilitation and reconstruction of roadways, pothole repair, restoring access after storm damage, shoulder/bank grading, and shoulder/bank edge repair. Future activities would also likely include rehabilitation and reconstruction of other roadways and washes within the Preserve. Reconstruction, rehabilitation, and maintenance actions have the potential to have a beneficial affect Preserve transportation patterns.

Conclusion. Under the Proposed Action, impacts to transportation would be detectable along all the roadways. Beneficial long-term impacts include road preservation, reduction in number and severity of accidents, reduced road washouts, lower roadway maintenance requirements, and less emergency roadway repair from storms lowering Preserve costs. The Proposed Action would result in impacts that would be localized within the project area, short-term impacts would be minor to moderate adverse depending on site. Long-term impact would be beneficial. The Proposed Action would result in impacts that would be localized within the project area, and would be short- and long-term, minor adverse, and short- and long-term, beneficial, and at a local scale. Cumulative impacts, including the Proposed Action, would be short- and long-term beneficial at a local scale.

VEGETATION

Impacts to vegetation resources were determined based on the following impact definitions and thresholds.

Negligible Impacts: There would be no observable or measurable impacts on native species populations, their habitats, or the natural processes sustaining them. Impacts would be well within natural fluctuations

Minor Impacts: Impacts on native species populations, their habitats, or the natural processes sustaining them would be detectable. Occasional responses to disturbance by some individuals could be expected. Small changes to local population numbers, population structure, and other demographic factors might occur. Sufficient habitat would remain functional to maintain the viability of the species in the Preserve.

Moderate Impacts: Impacts on native species populations, their habitats, or the natural processes sustaining them would be detectable. Frequent responses to disturbance by some individuals could be expected. Some impacts might occur in key characteristics of habitat. However,

sufficient population numbers or habitat in the Preserve would remain functional to maintain the viability of the species.

Major Impacts: Impacts on native species populations, their habitats, or the natural processes sustaining them would be detectable and permanent. Frequent responses to disturbance by some individuals would be expected. Local population numbers, population structure, and other demographic factors might experience large declines.

Short-term impacts: Short term impacts would occur during construction and last less than three years.

Long-term impacts: Long term impacts would last more than three years.

Alternative 1: No Action Alternative. Selection of the No Action alternative would represent a continuation of current conditions. Native vegetation could continue to be affected if vehicles inadvertently leave the roadway. Vegetation may be trampled, crushed, and could be destroyed should vehicles leave the roadways in non-designated areas. Fire could also impact large areas of desert vegetation with the potential for habitat conversion due to invasion by invasive plant species during the natural revegetation process. Vegetation could potentially be washed away during flood events. Individual native plants would be impacted, but large numbers of the population would likely not be affected. The roadways would likely continue as a corridor of dispersal for non-native invasive plants, but would not likely result in an increase in invasive species overall. The No Action alternative would result in impacts to individual native plant species (a relatively small portion of species populations), but there would be no effect on native species populations as a whole.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect vegetation resources include research and collection permits, past roadway improvement projects ongoing road maintenance activities, fire, and any future actions that result in the permanent removal of native vegetation. Ongoing scientific research and collection permits allow for the study and collection of species. These activities include rehabilitation and reconstruction of roadways, pothole repair, chip sealing, shoulder grading, shoulder edge repair, emergency road repair after flood events, and recreational development (such as kiosks, trailheads, visitor centers, and waysides). These roadways maintenance and recreational development activities would continue and may increase due to continued deterioration of the roadways and visitor use. Future activities would also likely include rehabilitation and reconstruction of other roadways within the Preserve. Reconstruction, rehabilitation, development, and maintenance actions have the potential to affect vegetation resources by disturbance and mortality of native plant species as well as an increase in the spread of invasive species.

Conclusion. Under the No Action alternative, existing conditions constitute short- and long-term, negligible, adverse impacts to vegetation in the vicinity of the roadways. The overall cumulative impacts from past, present, and reasonably foreseeable future impacts, in combination with the No Action alternative, would be short- and long-term, negligible, and adverse.

Alternative 2: Proposed Action. Under the Proposed Action, the project would include road realignment (improving roadways banking/tilting; improving poorly designed intersections; adding improved signage) and reconstruction (modifying sharp curves and/or dips) at six Sites

and reconstructing washes along two other roadways. Paving of a graveled parking area at Kelso Depot would also occur. Staging for construction activities would occur within previously disturbed areas. Total new soil disturbance would be approximately 10.65 acres including 1.7 acres of Creosote Scrub, 3.35 acres of Creosote/Joshua Tree/Yucca Scrub, 3.38 acres of Cholla/Yucca/Mesquite Scrub, and 1.8 acres of Chrysothamnus/Greasewood Scrub. In addition, one to several creosote bushes that occur on the constructed berm between Kelso-Cima Road and the adjacent wash may be removed during construction. Areas disturbed during construction may be more susceptible to invasion by non-native invasive plant species. However, the steamcleaning of all construction equipment before arriving on site would reduce the potential for bringing invasive plant propagules into the action area from outside the Preserve. The roadways would continue to serve as a corridor for dispersal of non-native invasive plants, some of which could potentially out-compete native plants for limited water resources.

The Proposed Action would likely affect a relatively small portion of species populations, result in short-term changes in plant species composition and/or structure consistent with expected successional pathways of a given plant community from a natural disturbance event, and result in an increase in the potential for invasive species to establish in limited locations. Any vegetation (Joshua Trees, chollas, Yucca, etc.) removed for the roadways realignment would be transplanted to nursery areas and identified for revegetation. Rehabilitation (revegetation) of approximately 1.3 acres along Sites 1, 2, and 3 would provide beneficial impacts to native vegetation in the project area. Sites 1, 2 and 3 are the only sites with substantial native vegetation communities that would be disturbed and therefore would require and benefit from transplanting, and reseeding and revegetation. The intersections at Kelso and Cima (Sites 4 and 5) are highly disturbed areas, and construction would not affect native vegetation. At Sites 6, 7 and 8 on Cedar Canyon and Black Canyon Road, construction would be limited to existing roadway footprints, and channel banks, and would not affect substantial native vegetation. For those species that don't transplant easily, seeds would be collected and grown in the Preserve nursery area for planting the following season. The species that would be used for revegetation are site specific and are shown in Table 6. Prior to disturbance; each site would be inventoried for species specific to that site. The Preserve would only collect seeds of native species within a 5-mile buffer of the site to ensure genotype. The seeds would then be grown in the Preserve nursery and planted in disturbed sites within that 5-mile buffer. The Preserve would water revegetated areas for up to two summers after planting to improve survival. In addition, mitigation measures for vegetation impacts under the Proposed Action would reduce impacts and protect Preserve resources.

Cumulative Impacts. For analysis of cumulative impacts to vegetation, past, present, and reasonably foreseeable future projects within or adjacent to the Preserve are the same as those outlined above for the No Action alternative. Ground disturbance associated with construction activities such as roadway rehabilitation and reconstruction, and recreational development would have localized effects, but native species populations over a large area would not change. Reconstruction, rehabilitation, development, and maintenance actions have the potential to affect vegetation resources by disturbance and mortality of native plant species as well as an increase in the spread of invasive species. Rehabilitation (revegetation and mulching) of approximately 1.3 acre and mitigation measures for vegetation impacts under the Proposed Action would reduce impacts, protect Preserve resources, and result in beneficial effects to vegetation resources.

Table 6: Plant Species Identified at Project Sites That May be Restored

Site 1	Site 2	Site 3	
<i>Larrea tridentata</i>	<i>Yucca Schidigera</i>	<i>Ephedra sp.</i>	<i>Senegalia greggii</i>
<i>Ambrosia dumosa</i>	<i>Yucca brevifolia</i>	<i>Scutellaria Mexicana</i>	<i>Coleogyne ramosissima</i>
<i>Lepidium fremontii</i>	<i>Coleogyne ramosissima</i>	<i>Sphaeralcea ambigua</i>	<i>Juniperus californica</i>
<i>Ambrosia salsola</i>	<i>Larrea tridentata</i>	<i>Encelia farinosa</i>	<i>Larrea tridentata</i>
	<i>Ephedra sp.</i>	<i>Ambrosia dumosa</i>	<i>Echinocereus sp</i>
	<i>Ambrosia dumosa</i>	<i>Tetradymia sp.</i>	<i>Stephanomeria exigua</i>
	<i>Stipa speciosa</i>	<i>Xylorhiza tortifolia</i>	<i>Stipa speciosa</i>
	<i>Gutierrezia sarothrae</i>	<i>Mirabilis laevis</i>	<i>Cylindropuntia equinocarpa</i>
	<i>Stipa hymenoides</i>	<i>Encelia actoni</i>	<i>Yucca brevifolia</i>
	<i>Encelia actoni</i>	<i>Kremaria erecta</i>	<i>Thamnosma montana</i>
	<i>Tetradymia sp.</i>	<i>Lycium andersonii</i>	<i>Opuntia basilaris</i>
	<i>Sphaeralcea ambigua</i>	<i>Psoralea arborescens</i>	<i>Lycium cooperi</i>
	<i>Xylorhiza tortifolia</i>	<i>Eriogonum fasciculatum</i>	
	<i>Kremaria erecta</i>	<i>Ambrosia salsola</i>	
	<i>Psoralea arborescens</i>	<i>Cylindropuntia ramosissima</i>	
	<i>Ambrosia salsola</i>	<i>Gutierrezia sarothrae</i>	
	<i>Ericameria linearifolia</i>	<i>Yucca Schidigera</i>	

Conclusion. Impacts to native vegetation would include crushing, trampling, transplanting, and removal within an approximately 10.65-acre area. Rehabilitation (revegetation and mulching) of approximately 1.3 acre along the roadway and mitigation measures would provide beneficial effects to native vegetation in the project area. Under the Proposed Action, impacts to native vegetation would be short- and long-term, minor to moderate adverse, and short- and long-term beneficial.

VISITOR EXPERIENCE/PUBLIC SAFETY

Information about visitor use and experience was compiled from various sources including Preserve staff, other NPS specialists, public comments, and other planning documents and research reports. The methods for assessing impacts on visitor use and experience are based on how the No Action and action alternatives would affect visitors, particularly with regard to visitors' enjoyment of resources and values and other important recreational opportunities.

Impact thresholds for visitor use and experience are defined as follows:

Negligible impacts: Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative.

Minor impacts: Changes in visitor use and/or experience would be detectable, although the changes would be slight. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.

Moderate impacts: Changes in visitor use and/or experience would be readily apparent. Visitors would be aware of the effects associated with the alternative, and would likely be able to express an opinion about the changes.

Major impacts: Changes in visitor use and/or experience would be readily apparent and have substantial consequences. Visitors would be aware of the effects associated with the alternative, and would likely express a strong opinion about the changes.

Short-term Impacts. Effects lasting for the duration of construction.

Long-term Impacts. Effects lasting longer than the duration of construction.

Alternative 1: No Action Alternative. Visitors that travel the roadways currently experience deteriorated road conditions, narrow travel lanes, steep dips and curves, soft and sandy shoulders, poor sight distance, and poorly marked intersections. Because of these conditions, visitors must pay close attention to the road surface, which could detract from the visitor experience of the Preserve. The existing conditions could cause vehicle collisions as a result of visitors driving too fast; vehicles involved in accidents as a result of the improperly banked curves in the road; and drivers losing control of their vehicles when they drop onto the soft shoulders or underestimate their speed for a given curve. Visitors can be rear ended at intersections where sight distances are poor.

Under the No Action alternative, visitors would benefit from the repair of the cracked deteriorated road surfaces. However the road surfaces would continue to deteriorate as many of the project roadways are at the end of their road life cycle. Accident rates would be expected to remain at about the same level as the current rate, potentially increasing as visitors increase. The existing roadway conditions would likely be detectable by visitors at a low level. Visitors would be exposed to limited hazards due to current roadway conditions.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect the visitor use/experience and visitor safety include past roadway improvement projects and ongoing road maintenance activities. These activities include rehabilitation and reconstruction of roadways, pothole repair, chip sealing, shoulder grading, shoulder edge repair, and recreational development (such as kiosks, trailheads, visitor centers, and waysides). These roadway maintenance and recreational development activities would continue and could increase due to continued deterioration of the roadway and increased visitor use. Future activities would also likely include rehabilitation and reconstruction of other roadways within the Preserve. Reconstruction, rehabilitation, development, and maintenance actions have the potential to affect visitor use/experience and visitor safety by potentially displacing visitors during high seasonal use periods, the visitor could detect deteriorated roadway conditions, and visitors could be exposed to limited hazards due to current roadway conditions. Past, present, and reasonably foreseeable future projects within the Preserve would likely contribute to changes in visitor use and safety hazards.

Conclusion. Under the No Action alternative, existing conditions would result in short- and long-term, minor to moderate, adverse impacts to visitor use/experience and visitor safety. The overall cumulative effects of these past, present, and reasonably foreseeable future actions on visitor use/experience and visitor safety, in conjunction with the No Action alternative, would have short-term, minor to moderate, adverse impacts.

Alternative 2: Proposed Action. Under the Proposed Action, visitors traveling during construction would experience construction noise, the presence of construction equipment, roadway detours, and construction-related traffic delays. During work at Sites 1 and 2, Kelbaker

Road may be closed from Baker to Kelso, and traffic detoured to Kelso-Cima and Cima Roads. Advance notice of these detours would be posted at key locations in and out of the Preserve.

Visitor safety may be impacted during the construction period from the presence of large construction equipment, construction activities, and road detours. Implementation of appropriate employee training, warning signs, and other measures would minimize adverse impacts during the construction period. Implementation of mitigation measures outlined for the Proposed Action would minimize potential impacts to visitor use/experience and visitor safety.

Once construction is completed, rehabilitation and reconstruction of the eight sites would result in improved roadway conditions, shoulders, sight distance, and flood control. Rehabilitation and reconstruction would also result in improvement of overall roadway safety and visitor experience. The Proposed Action would likely result in direct changes in visitor use and/or experience that would be readily apparent. Visitors would likely be aware of the effects associated with the roadway rehabilitation and reconstruction. The roadway rehabilitation and reconstruction would result in noticeable improvements to public health and safety.

Because the Proposed Action would not be adding additional impacts to the Preserve's scenic vistas, there would be a negligible effect to the visitors' experience of those scenic vistas.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions with the potential to affect the visitor use/experience and visitor safety include past roadway improvement projects and ongoing road maintenance activities. These activities include rehabilitation and reconstruction of roadways, pothole repair, chip sealing, shoulder grading, flooding repair, shoulder edge repair, and recreational development (such as kiosks, trailheads, visitor centers, and waysides). These roadway maintenance and recreational development activities would continue and may increase due to continued deterioration of the roadway and visitor use. Future activities would also likely include rehabilitation and reconstruction of other roadways within the Preserve. Reconstruction, rehabilitation, development, and maintenance actions have the potential to affect visitor use/experience and visitor safety by potentially displacing visitors during high seasonal use periods, the visitor may detect deteriorated roadway conditions, and visitors may be exposed to limited hazards due to current roadway conditions. Past, present, and reasonably foreseeable future projects within the Preserve would likely contribute to changes in visitor use and safety hazards.

The short-term effects to visitor use/experience would be related to construction activities and noise, the presence of construction equipment, road closures, and construction-related traffic delays. Since the cumulative projects would be spread throughout the Preserve and would not occur at the same time, these impacts could be noticeable to some visitors. Improvements associated with each of these projects, however, would improve overall visitor use/experience throughout the Preserve, and the improvements would be apparent to some visitors. There would be no long-term impacts to visitor experience of scenic vistas.

Conclusion. Under the Proposed Action, construction related to these projects could have short-term, negligible, adverse impacts to visitor safety assuming that appropriate employee training, warning signs for visitors, and other mitigation measures are implemented. Long-term reconstruction associated with these projects would have long-term, beneficial effects on visitor safety. The Proposed Action would provide short-term, moderate, adverse and long-term, beneficial contributions to cumulative effects. The cumulative effects of these past, present, and reasonably foreseeable future actions, in conjunction with the Proposed Action, would result in

short-term, moderate, adverse impacts and long-term moderate, beneficial effects to visitor use/experience and visitor safety. Impacts during the construction period for the Proposed Action would be short-term, moderate, and adverse. Once construction is completed, improvements would result in long-term, beneficial impacts to visitor use/experience and visitor safety. The cumulative effects in conjunction with the Proposed Action would result in short-term, moderate, adverse impacts and long-term beneficial effects to visitor use/experience and visitor safety.

CHAPTER 5: CONSULTATION AND COORDINATION

SCOPING COMMENT SUMMARY

The NPS published a Project Scoping Newsletter on January 15, 2014, commencing the planning process for the Reconstruct Road Segments to Improve Safety Project. On February 1, 2014, the NPS held a public meeting at the Interagency Fire Center at Hole in the Wall in the Preserve. The comment period closed on February 15, 2014. Over the 30-day comment period, a total of approximately 17 correspondences were received, not including comments received at the public meeting. The majority (11) of submittals were from unaffiliated individuals representing themselves as residents or visitors to the Preserve. The remaining (6) submittals were from the following agencies and organizations:

- California Department of Fish and Wildlife
- Lahontan Regional Water Quality Control Board
- Center for Biological Diversity
- Eastern Sierra Center for Applied Population Ecology
- Society for the Conservation of Bighorn Sheep
- Wild Sheep Foundation

The most common comments agreed with the purpose and need for the project, and congratulated the NPS on moving forward with the planned improvements. Many commenters also recommended additional measures to reduce speeds and improve safety throughout the Preserve, such as reduced speed limits, improved signage and the use of other techniques such as rumble strips and flashing signs. Many comments (primarily by residents of the Preserve) suggested locations for additional roadway improvements that are not part of the scope of the current project, particularly on the maintained dirt roads that develop potholes and/or washboard surfaces, and are subject to damage during floods. Comments by regulatory agencies (CA Department of Fish and Wildlife and Lahontan Regional Water Quality Control Board) primarily focused on potential impacts and mitigations for natural (wildlife, vegetation and surface water) resources, and on the regulatory and permit requirements associated with the planned projects. The commenters representing conservation or environmental organizations were concerned with impacts to natural resources such as desert tortoise and other wildlife, and were not generally in favor of the proposed project, instead recommending reduced speed limits and increased enforcement throughout the Preserve.

AGENCY CONSULTATION

U.S. Fish and Wildlife Service

In accordance with the ESA, the Preserve contacted the USFWS with regard to federally listed species. Consultation between NPS and USFWS is underway.

A biological assessment has been developed for submittal to the USFWS as part of ESA formal Section 7 consultation for the desert tortoise. It is anticipated that implementing the Proposed Action would result in a *may affect, but not likely to adversely affect* determination.

California State Historic Preservation Officer

In accordance with Section 106 of the NHPA, consultation is currently underway between the Preserve and the California State Historic Preservation Officer. Letters were received from the SHPO on May 2, 2014 and October 1, 2014. Phone conversations with the SHPO occurred on

July 18, 2014 and October 17, 2014. During the latter conversation, NPS and SHPO discussed avoidance and mitigation measures to address the *adverse effect* for the project. These measures will be identified in a Memorandum of Agreement (MOA). This MOA will be attached to the decision document.

NATIVE AMERICAN CONSULTATION

Consultation was initiated with Native American tribes to determine if there were any ethnographic resources in the project area and if they wanted to be involved in the environmental compliance process. The letters sent to the tribes informed them of the project, and requested preliminary comments regarding ethnographic resources. The NPS will also send tribes this EA and an invitation to participate in the MOA process.

PERMITS

A Nation-wide permit from the U.S. Army Corps of Engineers under Sections 401/404 of the Clean Water Act (CWA) would likely be required to implement the Proposed Action: The CWA requires a permit for any actions that would result in the placement of structures or dredged or fill materials into waters of the United States, such as the construction of low water crossings and stream channel armoring on Cedar Canyon and Black Canyon Roads.

Nation-wide Permits may be used to authorize temporary structures, fills, and work necessary to construct linear transportation projects such as the improvements proposed in this project. Appropriate measures must be taken to maintain downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

Permits from the Colorado River and/or Lahontan Regional Water Quality Control Boards (RWQCBs) may also be required per Sections 401 and 404 of the CWA. The northwestern portion of the Preserve is regulated by the Lahontan RWQCB, while the southeastern portion (including most of Cedar Canyon and Black Canyon Roads) is regulated by the Colorado River RWQCB. A National Pollutant Discharge Elimination System (NPDES) permit issued by the RWQCBs may be required for point sources of discharge such as culverts or man-made channels or ditches.

ENVIRONMENTAL ASSESSMENT REVIEW AND LIST OF RECIPIENTS

This EA will be released for public review in Fall 2014. All of the agencies, organizations and individuals that provided scoping comments will be notified of the availability of the EA. NPS will also publish and distribute a letter or press release to over 140 other agencies, tribes, organizations and members of the public on the park's mailing list, and place an ad in the local newspaper. Copies of this EA will be provided to interested individuals upon request. Copies of the document will also be available for review at the Preserve's visitor center, and will be posted on the NPS Planning, Environment, and Public Comment (PEPC) website at <http://parkplanning.nps.gov/moja-road-safety>.

The EA is subject to a 30-day public comment period. During this time, the public is encouraged to submit their written comments to the NPS address provided at the beginning of this document.

All public comments will be reviewed and analyzed following the close of the comment period and prior to the release of a decision document. NPS will issue responses to substantive comments received during the public comment period.

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ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ACHP	Advisory Council on Historic Preservation
BO	Biological Opinion
CDPA	California Desert Protection Act
CDFW	California Department of Fish and Wildlife
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
CWRCB	California Water Resources Control Board
CWA	Clean Water Act
DO	Director's Order
EA	Environmental Assessment
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FPPA	Farmland Protection Policy Act
FRV	Fundamental Resources and Value
GHG	Greenhouse gas
GMP	General Management Plan
LWC	Low Water Crossing
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NWPS	National Wilderness Preservation System
PEPC	Planning, Environment, and Public Comment
PWR	Pacific West Region
RWQCB	Regional Water Quality Control Board
SHPO	State Historic Preservation Officer
THPO	Tribal Historic Preservation Officer
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service